Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone and Sound Waves
PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY, MONADNOCK BLOCK, CHICAGO

VOLUME 63, NUMBER 23
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CLASSIFIED ADVERTISEMENTS, PAGE 47

CHICAGO, DECEMBER 7, 1912

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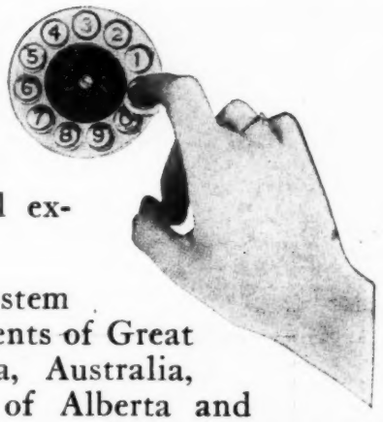

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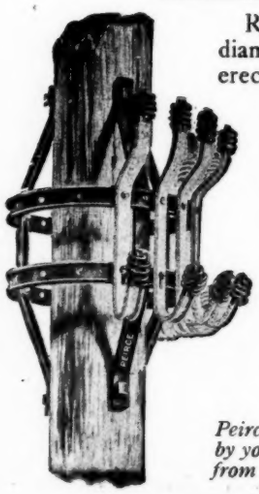

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Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1897

Volume 63
Number 23

CHICAGO, SATURDAY, DECEMBER 7, 1912

Subscription - 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

Unscrambling the Eggs.

The Supreme Court of the United States has "unscrambled" the Union Pacific-Southern Pacific mixture, and has ordered the first named corporation to divest itself of its controlling stock holdings in the latter. The decision which held that the condition was maintained in violation of the Sherman anti-trust law, is of more than passing interest to the telephone field, although the points of law involved may not directly apply to this industry.

Particularly interesting, however, is the court's interpretation of competition and its determination of the functions of justice in conserving competition according to statute. Here are some extracts from the decisions:

"To compete is to strive for something which another is actively seeking and reaches to gain."

"While the law may not be able to enforce competition, it can reach combinations which render competition impracticable."

"It may be regarded as settled that a combination which places railroads engaged in interstate commerce in such relation as to create a single dominating control in one corporation, whereby natural and existing competition in interstate commerce is unduly restricted or suppressed, is within condemnation of the act."

"We think it can make no difference that, instead of resorting to a holding company, as was done in the Northern Securities case, the controlling interest in the stock of one corporation is transferred to the other. The domination and control and the power to suppress competition are acquired in the one case no less than in the other, and the resulting mischief at which the statute was aimed is equally effective whichever form is adopted."

"It is the scope of such combinations and their power to suppress and stifle competition or create monopoly which determines the applicability of the act."

Without drawing any analogies, these pronouncements of the supreme court are undoubtedly enlightening, as being the most explicit yet made by that body in this connection.

A Pennsylvania Meeting.

It begins to look as though the next convention of the National Independent Telephone Association would be a lively session and furnish much material for discussion. On advertising page 45 of this issue of TELEPHONY, appears an announcement relative to the proposed organization of another association. This announcement was received by telegraph from John H. Wright, of Jamestown, N. Y., who added, "You may run the above in either display or reading matter, marking it advertising." TELEPHONY is acceding to Mr. Wright's request in printing the announcement as an advertisement and is making this reference to the proposed meeting as an interesting development in the Independent field. Difference of opinion over ways and means is always proof of the existence of a deep interest in any movement, and if the Pittsburgh meeting injects new life and vigor into the Independent telephone industry, it will have served a purpose. The criticism of the National Association by Mr. Wright and his associates, as outlined in his "announcement," probably will come up in some concrete form at the Chicago convention.

The Telephone in Daily Business Life.

Years ago before the advent of the telephone, messenger boys were used to carry messages between departments and offices. In many cases where the matter could not be handled by correspondence, a great amount of time was consumed in journeying from one office to another to transact business which did not require more than a few minutes' time. When the telephone came into use, time consuming trips were gradually abandoned and much of the heavy mass of local correspondence eliminated.

An instance which illustrates in a striking manner the change in business methods produced by the use of the telephone, was related by Dr. Elliott, president emeritus of Harvard in an address before the Massachusetts Board of Trade.

"I was in a great hardware store in St. Louis about a dozen years ago," said Dr. Elliott, "and Mr. Simmons, the proprietor, showed me with great satisfaction a bridge that connects the two blocks of which his store was then composed, and which passed at a high level across the city street.

I was there again later, and he told me that the construction of that bridge had made thousands of dollars of difference in the expenses of his firm, as it enabled him to deliver with much greater promptness than ever before.

I was there about 10 years afterwards, and while walking about the same two blocks came upon this bridge. There was a gate at each end of the bridge, and it was very dusty and dirty. It looked as though no one had walked across it for years. I asked, 'Why is that bridge abandoned?' 'Because,' he said, 'we have a very much better means of communication than we had when you were here before. We have abandoned that bridge in favor of something very much better.'

He then took me into a room where there were 60 telephones incessantly at work. I found that the travel between these two blocks had been almost stopped by the use of the telephone. He said: 'The introduction of this telephone room has saved us many thousands of dollars a year, in spite of the considerable cost of the operators and instruments.'"

Occasions have come up in recent years where a town or a business district of a city has been deprived of telephone service for a considerable length of time. Such an occurence happened several years ago during the building of the subway in New York. In making the excavation in the downtown district, an explosion of dynamite occurred which so damaged the telephone cables in that district as to deprive the business houses entirely of telephone service. During the interval, before service was again given, transaction of business was decidedly unsatisfactory.

Those who were obliged to do without the telephone for those few days realized that it would be impossible for them to carry on their business with any degree of satisfaction were they to be deprived of its use and obliged to go back to the old methods of messengers and personal calls. Just another instance of that old saying, "We never miss the water until the well runs dry."

Telephony's Directory is in the Making.

TELEPHONY'S force of directory experts, which has been busy ever since the last issue of the annual Directory of the Telephone Industry gathering and compiling statistics from the field, has now commenced its final efforts looking to the publication of the 1913 Directory.

The regular directory staff, which has specialized on this work for years and is constantly employed in canvassing every possible source of information, is now arranging and cataloging its data for final correction. In this it must look for substantial aid to the individuals and companies which are engaged in the telephone business.

Thus far it has never done so in vain. Letters asking confirmation of details, or correction, where necessary, have almost uniformly received early and careful attention on the part of the operators of the country. There is no reason to doubt that the same helpful spirit will characterize the forthcoming issue.

Nevertheless, TELEPHONY wishes at this time to especially emphasize the importance of such co-operation. When you receive an inquiry from the Directory Department, please answer it at once. This requires but a moment and costs you nothing but the time expended. To us it is one more verification of an item making up the Directory and, as such, of first importance.

The book will contain this year much new and original matter of value to operating telephone men. We have gone over the field carefully, have eliminated matter which seemed of minor importance and have substituted for it that which covers the latest developments in the engineering, traffic, commercial and accounting branches of the art. Every line is being rigidly scrutinized to detect anything erroneous or obsolete, and the result will be a compendium of practical information not to be obtained elsewhere.

The list of manufacturers, jobbers, engineers, etc., is being carefully revised. When complete. it will include only those men, firms and products which the past year has demonstrated to our satisfaction to be representative of the livest and best in the field. This list will be authoritative and will, in itself, constitute a reference work which is without a competitor in the telephone industry.

The 1913 Directory of the Telephone Industry will issue in the early part of January. To insure its prompt and accurate publication, we again ask that you give us all the assistance in your power.

The Game of Baseball and of Life.

Every baseball fan remembers that day when he played games of one or two o'cat and what a contest there always was for positions at bat or for the one which would bring them to bat soonest. Every boy had his chance. Maybe he did not get a chance to hit the ball at the morning recess of school, but the next time the crowd got together, he may have been on the "in" side during the entire time. Again the next day his luck would be changed and he would be obliged to play in the field the entire time, running here and there after the ball.

So the games would go on from day to day. The poor player of one day would be the star of another, pitting himself against all others. Each boy had hope and there was always opportunity. So with the game of life, there is always opportunity. Possibly it does not come today or tomorrow but it is sure to come.

In baseball a boy believing he could be a pitcher would practice until he had an opportunity to try his skill. He always had the opportunity. Another boy would do better as a catcher or first baseman and therefore practiced specially for those positions so that when later the neighborhood nine was organized, he might win a place on it.

Business life is not unlike the baseball game. Men are successful in various lines but they do not attain their success without preparation. They play the game all the time, being on the alert for their opportunity. Some of them have achieved their high positions through specialization and others through being all around men, but always they were like the boy playing one o'cat, full of hope and watching for their opportunity.

That Fool

By HERBERT KAUFMAN

If you hope to improve the World, first look to be reproved. Man is suspicious of his benefactors. Jenner was fought and cursed for fighting the smallpox curse. The universe does not drop its beliefs—they must be knocked down by proof.

The mere possession of knowledge is nothing—it is totally useless until it is used.

You can't plant a new crop in an old field until you clear away the stubble. The birth of an idea usually means the death of an ideal.

Columbus was sure that the world was a giant apple and not a geological pancake, but he had to produce a western hemisphere before the fifteenth century believed in an eastern one.

Your father had the chance to buy a share of the original telephone stock, but because he was an average man and therefore narrow and suspicious of all he did not understand, he congratulated himself upon his common sense and invested the money in cigars.

Your ancestors broiled a few thousand gentlemen for insulting their vanity—for the terrible crime of thinking differently.

Those who yearn to wear the laurel wreath must learn to wear the fool's cap. The difference between a jackass and genius isn't so much a matter of ears as of years.

Great ambitions must be backed by great control, great denial and great determination. They who understand most are sometimes least understood.

Just one man in a hundred can see beyond his nose—the shortsighted people are in the majority—and the majority rules. Only imagination can visualize what is to be—most people have no imagination, therefore they doubt and ridicule what they do not comprehend. To them the oak is never apparent in the acorn.

"That fool" rang in the ears of every crusader of progress. Most illustrious men divide their careers into three chapters:

CHAPTER ONE.
THE TIME WHEN THEY JEERED ME.

CHAPTER TWO.
THE TIME WHEN THEY CHEERED ME.

CHAPTER THREE.
THE TIME WHEN THEY FEARED ME.

Fortune disdains mere ability—brain is nothing without bravery. The man who can be thrashed by a sneer has retreated before he is defeated. Half the new town halls are gifts from "blamed fools" who left home because they couldn't get a sixty-horse-power opportunity in a one-horse village. Marshall Field was dismissed for incompetency by a brilliant cross roads merchant prince.

Success is only for those who are willing to stand by their standards—who are ready to endure the siege of misjudgment—who are prepared to face the fire of criticism and to accept defeat until they become vaccinated by it. Most men who gave up would have arrived if they had kept up.

Nothing can be accomplished by a coward—everything is possible to the courageous. The realm of "You Can't" is dwindling every year—its coast-line is being eaten away by each successive surge of advancement. The greatest works of humanity are still incubating in the womb of time. They will be achieved by the "fools" who won't lie down until they've downed some lie.

Copyright by Herbert Kaufman

The Cable Splicer's Testing Outfit—The Tone Testing Set

Description of the Various Methods of Cable Testing in Magneto Plants—Requirements of an Outfit for Testing on Common Battery Telephone Lines—The Tone Test—Explanation of Its Operation and Application

By V. H. Dake

When local battery magneto equipment was supreme, a splicer's testing outfit consisted of but the most simple apparatus. A head receiver and a few cells of dry battery were sufficient. Frequently a buzzer was employed and occasionally an outfit might be found to include a voltmeter, the latter being an expensive but extremely useful article. Various other devices are known to have been used, among them the lineman's magneto set, which required the services of at least three workmen if anything like reasonable speed were to be obtained, one man being employed to turn the crank while the other two did the testing.

The testing of a dead section of cable was and is today a simple matter, if only a rough test were desired. After removing about eight inches of the lead sheathing from each end of the dead section, the wires at one end were cleared from contact with each other and those at the other end "skinned," so as to expose one or two inches of bare wire. These were then "bunched" in such a manner as to assure

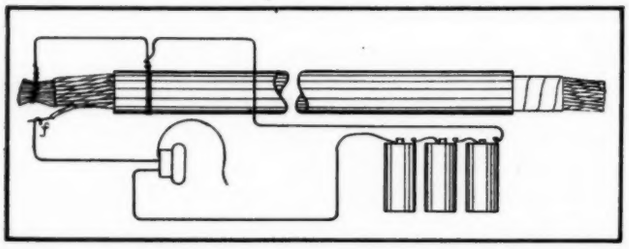


Fig. 1. Connections for Finding Grounded or Crossed Conductor.

electrical contact between all wires and the bunching connected to the cable sheath. A receiver and battery of one or two dry cells, connected as shown in Fig. 1, might then be employed to determine if any one of the conductors were in contact with the sheath or with another conductor, by removing the conductors, one at a time, from the bunching and touching each with the finder *f*.

The click obtained in the receiver upon first touching a wire was not considered to be an indication of trouble, but was on the contrary accepted as a sign of a perfect conductor, if no sound were noted at subsequent applications of the finder. The click observed on first touching the wire was due to a rush of current over the wire, which acted as one plate of a condenser, of which the remaining bunched wires and the sheath formed the other plate. All faulty conductors were marked and tested separately against each other and the sheath to determine the exact nature of each fault. If all wires were found to be clear of grounds and crosses, they were again bunched and the test for opens made. The connections for this test are shown in Fig. 2. Clicks obtained by the application of the finder to the wires denoted perfect conductors, the absence of clicks open wires.

Tests for opens followed instead of preceding those for grounds and crosses. This was done for the reason that grounded or crossed conductors, bunched with the perfect ones, might be a source of error in the open wire test. Such conductors were tested separately and with the aid of an insulated wire between the ends of the cable, if the conditions were such as to preclude the use of the sheath as a connecting medium.

In Fig. 3 is shown the connections of a buzzer and dry battery and of the lineman's magneto set when employed for making tests such as have been described. The buzzer and battery undoubtedly provided the easiest means of testing, but the employment of a receiver certainly assured the most deli-

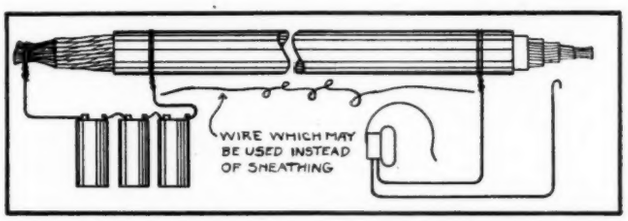


Fig. 2. The Test for Open Conductors.

cate test, it being one of the most sensitive of current detectors.

A buzzer wound to approximately 100 ohms resistance and requiring from 10 to 12 dry cells to operate it, was found by the writer to give excellent results on this and other classes of work described later. A buzzer so highly wound is not at all necessary in testing short lengths of cable. The buzzer should have approximately one ohm of winding for each ohm of cable conductor. The *emf* necessary to operate a low wound buzzer through a long circuit would require a battery of large proportions.

New construction to be tested out or wires to be picked up at splices or terminals on working cables received treatment which is in general that described. However, the more important tests are considered in detail.

Between distant points, some form of a talking circuit was

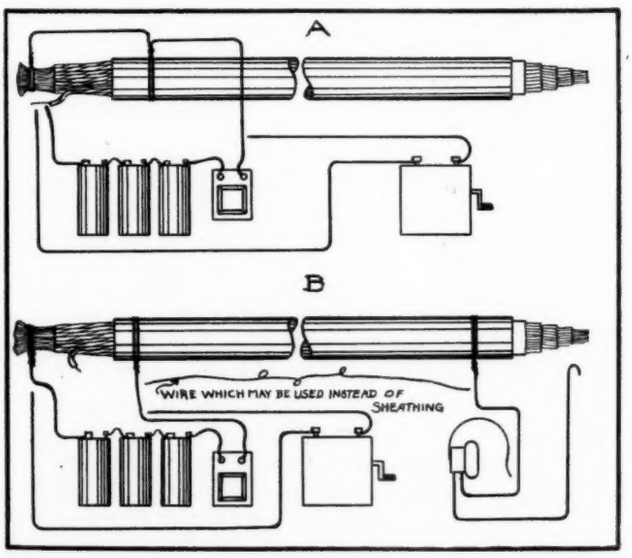


Fig. 3. Circuit Connections Using Buzzer or Test Set.

necessary in order that the splicer might be in constant communication with his helper. The instruments used were receivers or lineman's testing sets which were either connected metallically by a pair of cable conductors or by a

grounded circuit, one side only of the pair being used. This wire or pair of wires was picked up by the helper at the distant end by testing each pair until he found the wires to which the splicer's receiver was attached.

All pairs might then be tested for continuity and transpositions by using each of the wires in turn for a talking circuit, the workmen returning to the original talking circuit whenever they were unable to converse over any pair under test. In this manner new construction or dead cables might be quite thoroughly tested for opens or misplaced pairs. The method is undoubtedly one of the most primitive, but has nevertheless served its purpose. Tests for grounds and crosses were made after the manner indicated at Fig. I.

With the aid of a third receiver and either a battery alone or 100-ohm buzzer and battery, the tests were more easily made, the circuits used being indicated by sketch *A*, Fig. 4. The splicer at one end of the cable attached the free terminal *e* of the buzzer to a conductor for which the helper at the opposite end of the cable searched with his finder *f*, and the completion of the circuit by the helper caused the buzzer to operate. Each of the other wires were in turn tested and the splicer "rung off" by the helper as each was found to be O. K.

By "ringing off" is meant the signal given by the helper to the splicer when he wished the latter to change from one wire to another. For this the now famous "Skidoo" number has been much used, the helper causing the buzzer to buzz out 23 (one, two—one, two, three) when a change was desired. In sketch *B*, Fig. 4, is shown a method whereby the use of a third receiver might be obviated and at the same time permitting the buzzer to be placed in a positon where its noise would not interfere with other work. By this arrangement both the splicer and the helper hear the buzz through their receivers. Motor or generator current was frequently used for these tests, the splicer considering himself extremely lucky if he were working at an exchange where a power generator or pole changer was in use. The connections necessary

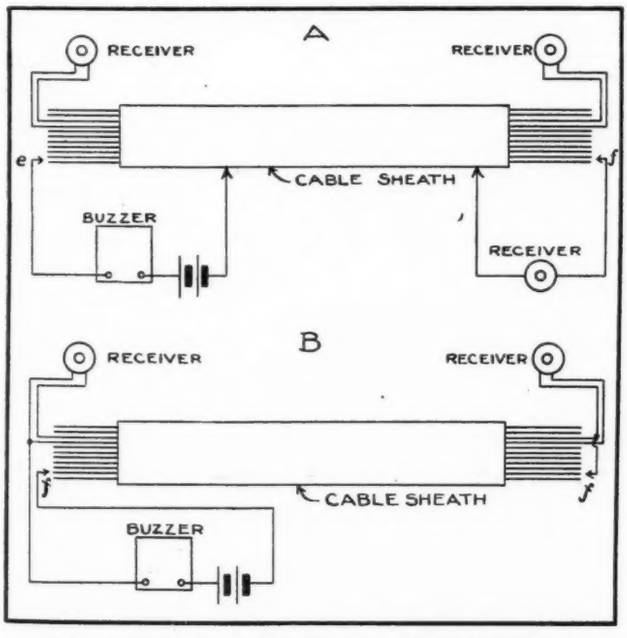


Fig. 4. Receiver Connections for Facilitating Testing.

are similar to those shown at *A*, Fig. 4, the battery being replaced by the generator or pole changer.

The selection of dead or spare wires at a splice in working a cable was accomplished with the aid of an arrangement similar to that shown by sketch *A*, Fig. 4. The details of the circuit depended upon the source of the current, that is whether generator, battery and buzzer or simply battery were used. Working pairs were not as easily selected, it sometimes being necessary to call central over the various working pairs until those desired were found. The use of a high wound buzzer, similar to that previously mentioned, was here found to be exceptionally convenient. It could be attached

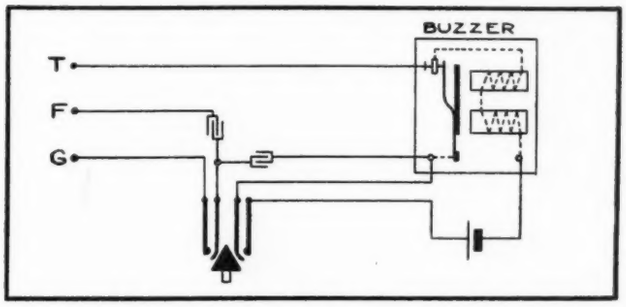


Fig. 5. The Tone Testing Set for Common Battery.

to one side of a working pair and that wire picked out and easily distinguished from even its mate, because the buzzer would not operate through the high resistance of the subscriber's instrument and the drop at the central office. For the reason just given, it was also possible with the buzzer to test working lines for reversed wires, a test not practicable with any of the other apparatus mentioned, with the possible exception of the voltmeter. The use of the voltmeter, however, was not convenient, as it required the constant attention of the workman.

From the descriptions and diagrams it is evident that while the tests employed did not seriously interfere with the service of local battery exchanges, they would practically paralyze the service of central battery exchange lines which passed through the cable under test. The requirements of a testing outfit for use in cables containing central battery lines are these: the line signal at the central office must not be operated; there must not be noise or induction great enough to interfere with conversation over the lines; the apparatus must produce a signal which, for the purposes of the splicer, must be as distinct as that produced by the generator or buzzer; and again, it must be simple and readily repaired by even the least intelligent workmen. Such an equipment is to be found in the tone testing set, the wiring of which is shown in Fig. 5.

The buzzer is one of the ordinary type of two or three ohms resistance. The two condensers may be of any capacity, the writer having used those of two M. F. capacity because they were at hand. One dry cell is sufficient to operate the set for several months in average use. The key is inserted for convenience in opening and closing the battery circuit. In order that the constant operation of the buzzer may not be annoying, it may be wrapped in cotton and packed in the containing box without being nailed or screwed fast. This will prevent excessive vibration.

The method of operating the tone set is illustrated in Fig. 6. Operator's breast transmitters and head receivers may be used to advantage in the talking circuit. When so used a battery of six volts should be connected in circuit as shown in sketch *B*. This battery furnishes current for both transmitters and is entirely sufficient for cable circuits up to three miles in length.

The pair to be used for communication between the splice and the testing end may be picked out at the splice by sending tone out over the pair in the manner indicated in diagram *A*. The workman at the splice grounds one terminal of his set through a condenser and searches for the tone with a needle point finder attached to the free end of the set. When the desired wire has been found, it is crossed with its mate. This

allows a portion of the tone to pass through the receiver at the central office and serves to notify the testman that the pair has been found. He then connects his set as shown in sketch *B*, at the same time removing the tone. The splicer, noting the discontinuance of the tone, removes the ground connection and places his set across the pair. The use of a condenser in series with the set prevents sending in a call when the needle comes in contact with a working line.

In sketch *B* it is assumed that the conductors 1 and 2 have been found and are to be used as a talking circuit. The finder *f* is connected to one side of the pair 1-2. The workman at the splice attaches his needle to the opposite wire in order that the tone may divide as it passes through the talking circuit, a portion passing through each receiver. As an illustration let it be assumed that conductors 5, 6, 9 and 10 are desired at the splice. These are to be considered as working pairs, 6 and 10 being directly grounded and 5 and 9 grounded through the line relays and battery at the central office, the testing end of the cable. The workman, at the splice, being unable to select the wires by appearances from among many others, places his needle in contact with some one wire in the

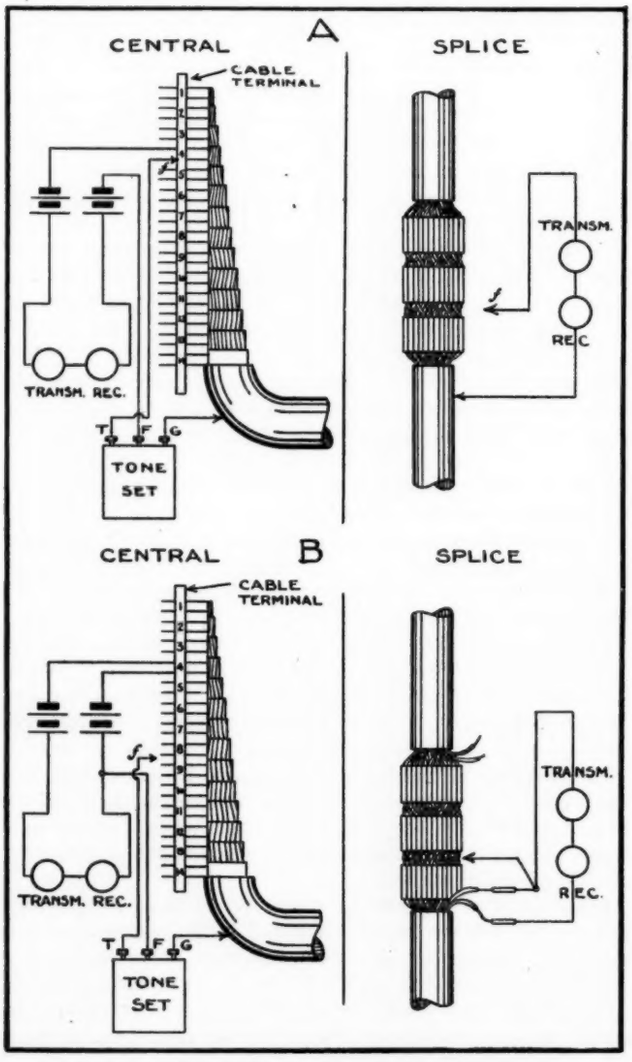


Fig. 6. Method of Using Tone Testing Equipment.

splice. The testman at the office terminal then touches each one of the cable wires there terminated, with his finder which is connected to the post *T* of the tone set. Upon touching the wire to which the splicer's needle is attached, each workman receives a loud tone through his receiver.

The loudness of the tone will depend much upon which side of the working pair the testman finds the splicer. The sound received over the grounded side of the line is weak in comparison with that on the battery or live side of the pair. One side of the pair having been found, the other is immediately tested and if the pair is one of those desired, it is properly

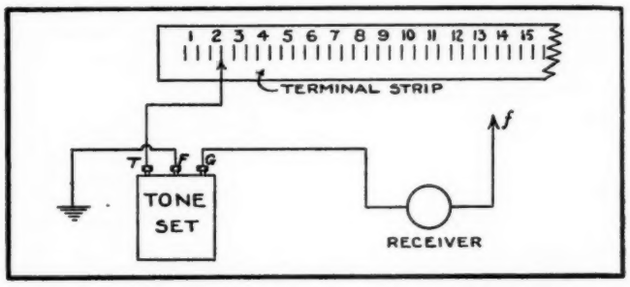


Fig. 7. Tone Test Circuit for Locating Crossed Wires.

tagged and the search proceeded with as before. If only one or two pairs are desired, it is much easier and quicker for the splicer to do the searching. But to do this, the pairs must be disconnected from the office equipment at the central office, the tone post connected directly to the pairs desired and the tone left on them until found by the splicer. This procedure, of course, interrupts service and is a method not to be recommended if many wires are to be located.

Should the splicer be in doubt as to the grounded conductor of a pair, he may make a more complete test by placing his needle in contact with both conductors, which action will bring the operator in on the line. The insertion of the operator's plug removes the direct ground from the line and therefore permits a perfect tone to be obtained over each conductor. With very little practice, the splicer will be able to do the trick without annoying the operator. When the central office equipment includes line relays which have a winding on each side of the line, the difficulty mentioned above will not be experienced. The splicer soon becomes accustomed to his tone set and is able to distinguish each tone and understand its meaning.

Working or dead cables may be tested for open or reversed pairs with the aid of this set and the work done rapidly and accurately. The set may also be used to test for crosses, Fig. 7 indicating the connections for such work.

Successful operation of the set depends to a great extent

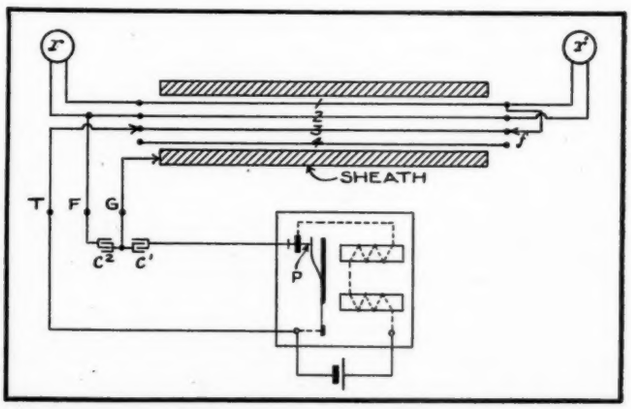


Fig. 8. Circuit Showing Importance of Ground Connection.

upon the perfect quality of all ground connections. The post marked *G* should be connected directly to the cable sheath and an electrical connection made between the ends of the sheath across all open splices. The importance of the ground connection may be explained with the aid of Fig. 8.

During the operation of the buzzer, its armature is contin-

ually making contact with, and being drawn away from, the contact point *P*. When the armature is away from that point, a slight current flows out into the leads marked *F*, *G* and *T* and eventually into the cable sheath and conductors to which they are attached. The currents which flow into *F* and *G* are of like sign and opposite to that which flow into *T*. Now the resistance offered to the flow of current through the leads *G* and *T* to the sheath and conductor 3, is much less than that offered to its passage through the lead *F*, through the receiver *r* to the conductors 1 and 2, because of the resistance of the receiver and also to the fact that there is an additional condenser C^2 in that lead. Again the condenser formed by the sheath and conductor 3, is of much greater capacity than that formed by the conductors 1 and 2 and the conductor 3 consequently the charge absorbed by the former condenser is much greater than that taken by the latter. In fact, practically none of the current is absorbed by the conductors 1 and 2, as is proven by the fact that no sound is heard in the receiver *r*. As the armature again comes in contact with the contact point *P*, there is a rush of current from the condenser, and it is discharged only to become charged again at the armature moves away from the point *P*.

If the connection between the ground post *G* and the sheath be removed, the condenser formed by the conductors 1 and 2 and the conductor 3, must absorb all the current thus causing a distinct sound or tone in the receiver. This will occur no matter to what conductors the leads *F* and *T* are connected, as long as the ground connection remains broken.

Assume the ground connection to be perfect and let the conductors 1 and 2 be connected to 3 through the finder *f*. Then the resistance between them becomes small as compared with that between 3 and the sheath. Consequently the major portion of each charge (the tone) will pass through each receiver. In this way the splicer may know when he has found the right wire, for if his finder *f* touches any other wire than that to which the tone post *T* is connected, no sound will be heard in the receivers.

The reason for the subdued tone on the grounded side of a pair must now be apparent, as the tone is short circuited, the current passing to ground through the line ground and returning to the set through the ground lead *G*.

The battery switch, Fig. 5, may also be made to open and close the ground connection. This arrangement serves to remove the ground from the talking circuit when the tone set is not in use.

The writer finds the tone set an excellent interrupter for use in conjunction with the Wheatstone bridge when making open wire locations.

Dry cells are recommended for use in the talking circuit but if the work to be done necessitates much moving about flash light cells may be used to advantage. Their convenience more than offsets the increased cost due to frequent renewals.

One Eternal Possibility

Putting One's Foot In It—Other Comments

By J. C. Kelsey

I am not sure who it was that said: "O, Lord, we are prone to wander!"

Ever since the incident of the Garden of Eden, we have had a pretty close insight into this weakness of human nature.

You remember that Adam had everything. But beyond the garden limits, there seemed to be an apple which looked better to Eve than a new hat. She broke the Eden ordinances, the penalty of which was to go out into a cold and uncharitable world to make a living.

Their descendants have never had great reason to be thankful for this original folly.

Later, Job got his foot in it. It seems that he cornered all the sheep, cattle and food product of the country, and was, accordingly, punished—not by a Sherman law, but by a higher power which made life very exciting for various Israelites.

Not only is man prone to wander, but he is also born to trouble as the sparks fly upward.

"Man that is born of woman
Is of few days and is full of trouble.
He holdeth his head high in the morning, but at eventide knows that he has made an ass of himself.
His friends force him to take a hand in a card-game
And abuse him for a sleepy misplay!
The north wind causeth him coal bills
And the east wind bringeth rheumatism!
Let him flee unto Hepsidam where the lion roareth, and the Whangdoodle mourneth for its first-born.
Then shall he cease from troubling and his soul shall be at rest!"

When I wrote the story of November 2, I was blissfully unconscious of offending more than the usual number of people.

When a man writes a weekly story at all fit to read, one that will suit you and the editors, he surely gets into new and peculiar mental conditions.

If a man is a writer by profession, then he does not mind the insanity part—it goes with the business. But if he writes for diversion only, the question of insanity is dangerous because it affects his other and regular occupation.

This issue of TELEPHONY is my 154th. If I have not succeeded in making every reader hostile at one time, I am fortunate indeed!

When I started to write, I knew full well that I would get no benefit from it—that it would only make me trouble. If I could by any means of publicity induce certain reforms, you would get the benefit, and then you would forget.

We are all prone to despise the steps that lift us to relief or affluence. Climbing, whether social or commercial is a cruel game. It gives no quarter, but strange to say it expects some.

The issue of November 2 was based upon a campaign article that "the public wants facts."

The reference to the York controversy was clipped from an Omaha paper. It was merely intended to show that people are not satisfied with facts—they only prefer them when it favors their pockets.

I have no grievance against any man or corporation. I do not particularly like trouble. The world does not owe me a living, and I do not take myself seriously, as some take me.

I confess that I am getting somewhat nervous about Nebraska. A Nebraska man called me down about that sterling friend of the people, Mr. Roosevelt. (By the way, his predictions about "Ted," as he called him, were not correct.)

In spite of this error of mine, I did not profit by the experience. I ran headlong into my good friends at York. And I am going to publish their letters, too—not in scorn, but in an earnest desire to set things straight.

In accidentally killing a man, you can make some amends by paying funeral expenses, but it does not bring the man back—neither can unjust words be unscrambled!

York, Nebr., Nov. 16, 1912.

"Mr. J. C. Kelsey,
Financial Editor, TELEPHONY.

Dear Sir:—

I have been an interested reader of your staccato notes in TELEPHONY ever since they were started. I envy you your unique manner of saying things. Usually I find your observations fair when you observe with full knowledge of the facts. When, however, you make inferences without having all of the facts and conditions in mind, you are as likely as anyone to err in your deductions.

This note is prompted by a reading of your comments in the November 2 issue of TELEPHONY, on the rate question in York. In the first place, your information is taken from a paper that I have read for a good many years, and I am not greatly surprised, therefore, that in this matter you got started off on the wrong foot.

The expected has happened; you quote. 'The rates are to be raised since the Bell took over the York county Independent.'

If I wanted to be captious I might quote the French proverb that 'it is the *unexpected* that happens.'

Then again: this is the first authoritative information I have had that 'the Bell took over the York county Independent.'

Being one of the organizers of the 'York county Independent,' and one of its directors during its 10 years of history, and being from the first consulted as to the consolidation of the telephone interests in this part of Nebraska, I think I am not in position to say most emphatically that the Bell has *not* taken over the 'York county Independent.'

In the second place, it is only a partial truth to say that 'the rates are to be raised.' The Lincoln Telephone & Telegraph Co., present owner of the telephone systems in York county, has made application to the state Railway Commission to be allowed to equalize its charges in its York exchange, so that *all* its subscribers will pay the same rates.

This rate is no more for a combined service than its hundreds of subscribers have paid for years without complaint for only a partial service. The large number of business men in York, who have felt the pressure to pay for a dual service, now get the *entire service* without the annoyance incident to the two telephone system, and at an actual saving of 40 per cent. in their cost.

Besides all this is this fact: When the 'York county Independent' was organized, the same mistake was made that was made by practically every Independent company in the United States, especially those organized as long as 10 years ago; that is, the rates were fixed entirely too low to insure permanency to the company.

This was due to a number of causes, chief of which is the fact that it was utterly impossible for men, ignorant of the entire telephone business, to know what rates would be permanently remunerative; and it was an impossibility for us to have any conception of the enormous development of the business.

The directors of the 'York county Independent' have realized for five years that an advance in rates for some classes of its service was absolutely necessary if the company's permanency was to be assured. The 'war conditions' prevailing in this county for 10 years caused the directors to defer this step just as long as possible, hoping that a more favorable time would come soon.

This 'more favorable' condition was not realized until the purchase of both systems here by the L. T. & T. Co., but the advance would have come with the Independents very soon, without regard to the merger.

It is true that the Independent company here paid a fair rate of dividend to its stockholders. This was necessary in order to get funds to respond to the demands for service. But the rate of dividend paid by no means determines the adequacy or inadequacy of the rates. It may be suggestive but no more than that.

The rates of the 'York county Independent' did not afford sufficient margin for depreciation and, now that a larger and more satisfactory service is given, this but adds force to the other argument for a readjustment of the schedule.

The 'York county Independent' might have built cheaper lines, and installed cheaper equipment than it did, but it was led to believe that 'Kellogg boards and telephones are the best,' and in the end the cheapest, even though the initial investment was greater.

I would be glad if you will give this letter the same publicity that your comments have received.

(Signed) J. M. Bell."

Of course, my mistake was made in letting the inference of the Omaha paper stand unchallenged. The paper inferred that the Bell company owned the property. I know better than that, and so does everyone else.

Had I thought the Nebraska deal was a straight out-and-out Bell matter, I would not have urged Mr. Wood's re-election to the board of directors of the national association. This brought an awful storm of disapproval from Independents.

You remember the convention re-elected him practically unanimously, and that cleared my mind as to the general belief about Nebraska.

Money is impersonal. It has no human attachments. The conventions have wasted valuable hours and days fighting over the ownership of property. It does not matter who owns the property; the behavior of the management is the better criterion.

Had we all realized this years ago, we would have been far ahead of the conditions of today. I never saw a business, whose leaders of early days were so far off in their judgments.

However, Rome was not built in a day. And the promoter element had to be washed through. They merely had something to sell.

I still insist that telephone consolidation costs the people more. Why not? Increased service, which comes from consolidation, naturally costs more to give. The only question in my mind is the behavior of the public. Will they pay it?

I know well enough how much it takes to run a telephone company and perpetuate it. I have seen the very heart of more telephone companies than you can name offhand.

No one ever heard me say that the rates of the average telephone company were too high. If you will read back, you will find that I preached depreciation charges years ago—in cash, too—long before some Bell companies ever realized its need.

I tried to make depreciation a natural tangible value, easily understood, measured on telephone station basis. Not the physical depreciation, but the invisible wear and tear. And to educate the public all the time to the fact that they are wearing out your property.

It's a poor thing to hand this out to the public all at once. It savors of the command of the foot-pad to "stand and deliver." That is where the mistake is made.

It is the old story—you had to brag to sell stock and then you had to beg to pay the dividend on the stock. Public memory cannot be effaced in 10 years.

The following circular speaks for itself and tells the won-

derful story of telephone development. They thought 200 telephones would suffice. It took 4,000 to supply the demand!

"LINCOLN TELEPHONE & TELEGRAPH CO.

TO OUR SUBCRIBERS: York, Neb., October 5, 1912.

When the Independent rates were fixed in York county, there was little basis for doing so intelligently. The Bell company had operated here for nearly 20 years, without competition, and had a total of slightly over 200 subscribers in the entire county. The Independents thought if they could secure an equal number in several years, against strong competition, it would be doing very well. They thought they could furnish that amount of service at *one-half* the Bell rates.

The rates were accordingly fixed at one-half those charged by the Bell. This would probably have worked out all right, if the service they were called on to furnish had not exceeded their anticipation.

But what are the facts? Instead of stopping at 200 subscribers, in two years they had 700; in four years, 1,800; in six years, 2,500; in eight years, 3,500; and now approximately 4,000. Such an expansion of service exceeded the dizziest flights of the most vivid imagination. Yet all this vast service has been furnished at rates fixed for an anticipated business of less than one-tenth that amount.

In addition to this, is the well known fact that the cost of operation, maintenance, and of everything used in the building of a plant have advanced exceedingly since these rates were fixed. The former management of the York company had realized for several years that the company could not long continue to furnish this service at these rates.

Now that the entire telephone system in York county will soon be open to every subscriber, it is impossible to postpone longer a change in rates. The management wishes to collect *only the actual cost of service.* To continue to do business, it is necessary to do this. No fair-minded man will object to this. 'Actual cost of service' is covered by three general items:

1. Operation and maintenance.
2. Depreciation of plant.
3. Reasonable return to stockholders.

While it is impossible to determine absolutely what rates will be sufficient to cover these items in the future, it is thought that we can furnish the combined service of both companies at the rates heretofore charged by the Bell company for its service alone. This certainly ought to be satisfactory to every one. These rates are for the York exchange, and are as follows:

Four party residence per month	$1.00
Two party residence per month	1.50
Individual residence per month	2.00
Farm—not to exceed 10 on line	1.50
Four party business per month	2.00
Two party business per month	2.50
Individual business per month	3.00

The local rates for other exchanges in York county remain unchanged. The 'county right' can be continued for $1 per month for business, and 50 cents per month for residence telephones, the service to be used from the telephone for which it is paid.

We ask the continued co-operation of all our subscribers in furnishing first-class service at reasonable rates.

Very truly yours, W. E. BELL,
District Commercial Manager."

The above rates are exceedingly fair. If a York business man kicks on $3 telephone service, he is discriminating. It is the cheapest thing he has. The housewife gets four-party service at $1 per month—too cheap!—it should at least be a nickel a day. The most prejudiced individual in the world cannot deny the justice of the York rates.

I am glad that I used the Omaha clipping. Had I not wandered off the reservation, we would never have had Mr. Bell's good letter.

We can only learn from the experience of others, and it's hard to get that, too.

If I offend any reader and misrepresent the facts, be kind enough to come back. You must hurry. Writing weekly letters is not a holiday affair, and I am liable to rest by the wayside.

Publicity is a new idea of civilization; naturally it is a blunt, brutal and crude instrument. Refinement consumes centuries.

It is a pity that our telephone business was born of war. It has its uses in war—it was Marshal Oyama's right hand bower. But it has so many more functions in peaceful pursuits.

Harsh things have been said and harsher things have been done. Any liberal-hearted man will readily understand that the excitement of the chase tends to make one more or less irresponsible—particularly regarding speech.

As I said before, writing is a peculiar game. You are striking directly at the pet hobbies of thousands and tens of thousands of individuals. One unconsciously takes on an air of authority, possibly because it is conferred upon him by people who take him seriously.

The words of our language are very limited, but can appear in countless garbs. I believe there will be a reaction some day, whereby magazines and story-sheets will be forbidden by law. A tortured people will then get some rest. The din of pen and pencil will cease.

What a cinch our ancestor had—with his coon-skin cap and his silver-mounted rifle. He had his own thoughts and was not irritated by the ideas of others.

If George Washington were alive for a time, he would be shocked at our freedom of expression. Even Abraham Lincoln would be surprised at the extent of free speech.

The world is moving slowly toward the equalization of mortal man. Publicity is merely one of the weapons of equalization. Pitiless analysis will alone convince a bull-headed race.

MORAL: Truth will out!

Notice of Meeting of A. I. E. E.

The 278th meeting of the American Institute of Electrical Engineers will be held in New York, December 13, 1912, in the auditorium of the Engineers' Building. The meeting will be held under the auspices of the high tension transmission committee and two papers will be presented as follows:

Comparative Tests on High Tension Suspension Insulators, by P. W. Sothman.

High Frequency Tests of Line Insulators, by L. E. Imlay and Percy H. Thomas.

Both of these papers are published in the A. I. E. E. Proceedings for December, and reprint copies are available for distribution on application to Institute headquarters.

Loaded Telephone Lines in Europe.

According to the Elek. Zeit. in continental Europe there are now more than 10,000 km. (6,000 miles) of telephone lines loaded with Pupin coils. The longest overhead loaded lines are from Berlin to Aix-la-Chapelle (700 km. or 420 miles) and from Berlin to Frankfort (580 km. or 350 miles). Still longer will be the line from Berlin in Germany to Milan in Italy now under construction (1,400 km. or 840 miles), which is to be extended later to the city of Rome (total length 2,000 km. or 1,200 miles). This, however, is still below the longest American loaded line, from New York to Denver (1,900 miles).

There are also a number of underground cables and the following submarine cables loaded with Pupin coils: From Freidrichshafen to Romanshorn (12 km. or 7 miles); from Dover to Calais (40 km. or 24 miles); from St. Margaret's Bay, Eng., to La Panne, Belgium (88 km. or 53 miles).

Alfalfa Granger Answers the Telephone

Words and Music by W. L. Capple

THAR GOES THET PESKY CACKLE TUB! I'M ALL-FIRED 'FRAID OF IT TOO I WISHED HAPOLIO THA HOTEL CLERK WUZ HERE TO DO HIS OYVN CHINNING
R-R-I-N-G-
TURF NEWS
1
HELLO-THIS IS THE PHONE INSPECTOR AND I'VE GOT A NEW KIND OF PHONE APPLIANCE I WANT TO TELL YOU ABOUT
TALK A LITTLE LOUDER 'SQUIRE, SAY THA CLERK AIN'T AROUND JEST NOW BUT IF YE GIVE IT TA ME I'LL TELL HIM
2
DID YOU GET IT? HAR-HAR-HAR. SUE APPLIANCE CO.
3
WHAT? YOU'RE MAD? AW-W BEAT IT AND SAY IF YOU GIVE ME ANY OF YOUR LIP I'LL HAVE TO BEAT YOU UP SAVEY?
YE CAN'T DO IT YE AIN'T MAN ENOUGH TA BEAT ME UP YOU BIG BUM
4
I AINT HUH?
5
HO-HUM— SECH A DREAM I'LL HAVE TA ROLL IN EARLIER NIGHTS I RECKON
TURF NEWS
6

Big Merger Authorized by Commission in New York

Public Service Body Grants Permission for Consolidation of Independent and Bell Plants in Territory in Northern New York State—Provision Made for Issuance of Necessary Securities—Limitations as to Rates—Protection to Subscribers

The consolidation of the Bell and Independent telephone companies in the counties of Clinton, Essex, Franklin and St. Lawrence, in northern New York, with minor extensions into Warren and Washington counties, will follow the order of the Public Service Commission, authorizing the Mountain Home Telephone Co., which is to be the name of the single remaining corporation, to increase its authorized capital stock from $150,000 to $1,000,000 and to execute a mortgage to cover all its present property, to secure a maximum issue of 5 per cent. bonds to the aggregate amount of $2,000,000.

The company is authorized to issue presently capital stock to the amount of $633,000 and bonds to the amount of $1,004,200. Bonds are to be issued at par and the proceeds of the stock and bonds are to be used for the purchase of the property and business of the Adirondack Home Telephone Co., the Clinton Telephone Co., and the New York Telephone Co., in the territory mentioned and for the refunding of the present outstanding bonds of the Adirondack, Clinton and Mountain Home companies.

The Adirondack company is also authorized in the order to transfer the franchise granted by the village of Canton to the Mountain Home company, and the New York Telephone Co. is authorized to transfer certain local franchises to the Mountain Home company.

On August 6, last, the commission denied the application now granted, stating at that time that the general purpose of the consolidation met with the approval of the commission and the amount of stock and bonds to be issued was reasonable for the purposes required, but that it developed at public hearings that it was the purpose of the Mountain Home company after acquiring the properties in question to put in a new schedule of rates which would effect a very considerable increase to a large number of subscribers.

The company did not at that time convince the commission that the proposed raises were justifiable and the application was denied. Since then negotiations have been had with the company and as a result a new schedule of rates has been submitted, designed to meet the objections raised by the commission.

Under the new schedule 196 subscribers to the Bell company will be increased an aggregate amount of $1,098 and, of the Independent companies, 1,214 subscribers will be increased an aggregate of $7,189, making a total of 1,410 subscribers whose rates will be increased an aggregate of $8,287. The rate of 200 subscribers to the New York Telephone Co. will be decreased $612.

The consolidation of the company will eliminate 689 duplications with an aggregate saving to the subscribers of $13,400 by reason of such eliminations. A total decrease for the entire territory, occasioned by decreases in rates and elimination of duplications will, therefore, for 889 subscribers accomplish a total saving of $14,012 as against an increase to 1,410 subscribers of $8,287. The net annual saving to the subscribers in the territory will, with offsets, it is claimed, therefore, amount to $5,725.

The authorization to increase the capitalization is made upon the express condition that the Mountain Home company shall, before making any change in existing rates, file with the commission its proposed schedule of rates, which shall not in any respect exceed the schedule heretofore submitted to the commission. The schedule so filed shall remain in force and effect for one year from the date of its filing.

The order further provides that nothing contained in the order shall be construed in any way whatsoever as approval of any rate contained in the schedule and that any person or persons aggrieved by the schedule rates may make complaint to the commission in the manner provided by law, and that the commission may make final determination upon such complaint without being bound in any respect by any provision of the order as constituting any determination upon the merits of the rates filed.

Provision is also made that, upon any complaint filed within six months after any increase in rates shall take effect, the commission shall order a reduction in such rates and the amount which shall have been collected and received by the Mountain Home company in excess of the amount allowed by the commission shall be refunded to the subscribers affected thereby, provided that refund may be held awaiting the decision of the courts in case any proceedings to test the validity of the order of the commission is brought within one month after the order shall have become effective.

The territory affected extends east and west 126 miles and north and south 85 miles. The area in square miles is 7,250 and the population nearly 220,000. It runs from Plattsburgh on the coast to Ogdensburg on the west, and swings in a circle just above Glens Falls on the east and Watertown on the west. Among the localities included in the territory are Plattsburg, Ogdensburg, Malone, Norwood, Canton, Potsdam, Saranac Lake, Lake Placid, Chateaugay, Lisbon, Madrid, Massena, Waddington, Fort Covington, Dannemora, Tupper Lake, Westport, Port Henry and Crown Point.

Supreme Court Applies Sherman Law.

On Tuesday the Supreme Court of the United States handed down another important decision under the Sherman anti-trust law, which will rank with those affecting the Standard Oil and American Tobacco interests. This decision ordered the Union Pacific Railroad Co. to divest itself of the stock it owns in the Southern Pacific Railroad Co., holding such control to be a violation of the Sherman act. The ruling is of interest to the telephone field as showing the construction placed by the court upon the situation. The decision said, in part:

"This court reaches the decision that the Union Pacific and Southern Pacific systems, prior to the stock purchase, were competitors engaged in interstate commerce, acting independently as to a large amount of such carrying trade, and that, since the acquisition of the stock in question, the dominating power of the Union Pacific has suppressed competition between the systems and has effected a combination in restraint of interstate commerce within the prohibition of the act.

In order to enforce the statute the court is required to forbid the doing in the future of acts like those which are found to have been done in violation thereof and to enter a decree which will effectually dissolve the combination found to exist in violation of the statute.

The decree should provide an injunction against the right to vote this stock while in the ownership or control of the Union Pacific company, or any corporation owned by it, or while held by any corporation or person for the Union Pacific company, and forbid any transfer or disposition thereof in such wise as to continue its control, and should provide an injunction

against the payment of dividends upon such stock while thus held except to a receiver to be appointed by the court which shall collect and hold such dividends until disposed of by the decree of the court.

As the court below dismissed the government's bill, it was unnecessary there to consider the disposition of the shares of stock acquired by the Union Pacific company, which acquisition, we hold, constituted an unlawful combination in violation of the anti-trust act.

In order to effectually conclude the operating force of the combination such disposition should be made subject to the approval and decree of the court, and any plan for the disposition of this stock must be such as to effectually dissolve the unlawful combination thus created."

Court Action to Force Compliance.

The New York Public Service Commission has directed its counsel to commence an action against the New York Telephone Co. for failure to comply with the commission's order of October 15, directing it to furnish telephone service to the Metropolitan Telegraph & Telephone Co., of New York City.

Union N. Bethell, president of the New York Telephone Co. declared that his company was perfectly justified in refusing to comply with the order of the commission and that the matter would be fought out to the end. He said that the entire affair had been put in the hands of the company's legal department. Mr. Bethell continued:

"The Telepost Co. has adopted the name of the Metropolitan Telegraph & Telephone, which was the predecessor of the New York Telephone Co., now doing business in New York City. The company has issued a number of bonds, some of which are still in the hands of the public. The New York Telephone Co. declined to comply with the order of the commission simply because we believe that the name of the Metropolitan company was not adopted in good faith."

Illinois Committee Approves Commission.

State control of public utilities in Illinois by a commission to be appointed by the governor will be recommended to the legislature by the investigating committee, which has just ended its hearings in Chicago. No exception is likely to be made for Chicago in the report. Despite Mayor Harrison and representatives of Chicago public service corporations who demanded a separate commission for Chicago, the majority of the committee is opposed to the idea.

Senators Glackin and Potter are the only members of the committee opposed to a state commission. Senator Dailey, chairman; Representatives Church, Scanlan, Holaday, Alschuler, and Gorman, and Senators Barr and Denvir are expected to approve of the commission idea, while Senator Glackin will make a minority report against such a body.

The split is likely over the home rule feature. The Chicago members, Church and Denvir, will demand a separate city commission. The downstate members will oppose their demands. The local men as a result may fight the bill on the floor. Chairman Dailey said, in an interview:

"I favor state regulation. Our public hearings in Chicago and other cities have not produced a single tenable argument against such a course. For months this committee has been investigating the plan in vogue in Wisconsin, New York, and other states. I feel certain the committee will agree upon state control of utilities, but just how the plan will be worked out remains to be seen. We shall try to incorporate in the bill all the best features of the Wisconsin and New York plans.

One suggestion is the appointment of a separate commission for Chicago. Personally I am opposed to that. I suggest one commission with headquarters in Chicago. I believe the governor should have the appointing power. I am not certain the 'home rule' plan would be legal.

Representatives of public service corporations who appeared before us failed to advance any arguments against commission control. They all admitted that commissions with men of recognized ability, such as have been on the Wisconsin board, would do much to better conditions. These men would have complete control and politics would be eliminated."

Indianapolis Telephone Merger Pending.

The committee on municipal welfare has submitted a report to the mayor of Indianapolis, Ind., and members of his advisory committee, in which he advises the merger of the two companies under the franchise of the Indianapolis Telephone Co.

The reports say it is understood that both companies have agreed to the merger, and that the board of public works is satisfied with all the arrangements, excepting the residence service rate. It is insisted by the board that the franchise should provide for a maximum rate of $30 a year, but the two companies favor a rate of $36. Both have agreed, however, to try the service for a year or two at $32, if the board will consent.

Mr. Moriety recommended that the sliding scale of rates and the other terms of the present franchise of the Independent company will be satisfactory and that it will give Indianapolis more favorable terms than obtain elsewhere.

The advisory committee has endorsed the proposed merger of the telephone companies and the matter will come before the board of public works at its next session. It is now believed that the merger will take place soon.

Department of Justice Gives Hearing.

Protests of Independent telephone interests against the American Telephone & Telegraph Co. as an alleged trust within the meaning of the Sherman law were discussed, says a Washington dispatch, at a long conference by Attorney Wickersham, Assistant to the Attorney General Fowler and Frederick A. Henry and Harrison B. McGraw of Cleveland, representing Independent companies principally in Pennsylvania.

Rate Regulations in New York State.

The New York Public Service Commission, has adopted a set of regulations, effective on and after January 1, 1913, prescribing the form and governing the filing and publication of rate schedules of telephone corporations subject to its supervision. Under these regulations all such telephone corporations will, on and after January 1, 1913, be required each to keep open for public inspection, and at all times during office hours, readily accessible to the public, copies of all its schedules established and filed with the commission in its main and branch operating offices.

It is also required that, at each branch office where contracts for service are made or payment for subscribers' service is received, and in each central operating office, copies of all established schedules of rates which apply within the area served by any such office and which apply as toll rates from any point within such area to any point outside such area, must be filed. Upon request for inspection these shall be immediately produced and such production shall be accompanied by such assistance on the part of the proper representative of the telephone corporation having such schedules in charge as will enable the person examining to determine accurately the rate, rental, or charge applicable to any particular kind of telephone service.

The order further requires that the tariffs of all such telephone corporations must be printed, and prescribes the form. It directs that all schedules containing rates for local service must be reissued in the prescribed form by April 1, 1913, and that all joint tariffs containing toll rates must be reissued by August 1, 1913, and brought into conformity with the regulations.

Practical Telephony for the Practical Exchange Manager

A Series of Articles Relating to the Construction, Maintenance and Operation of a Moderate Size Telephone Exchange, Which Began in the Issue of September 21—Cost of Changing from Magneto to Common Battery—Apparatus Used

By H. R. Van Deventer

To show just what parts are required for each telephone and also the parts from the magneto set which can be used in the common battery instruments attention is directed to the following list of apparatus. It should be remembered that the condenser has already been installed in the magneto telephones to make them workable on a common battery system.

Magneto apparatus	Common battery apparatus
condenser,	condenser,
ringer,	ringer,
switch hook,	switch hook,
transmitter,	transmitter,
transmitter arm,	transmitter arm,
receiver,	receiver.
induction coil,	
generator,	
battery.	

As only the direct current, common battery circuit is considered, the ordinary receiver as used in magneto telephones cannot be used with the common battery set.

The transmitter from the magneto set can be used on the common battery provided it is of the type which some manufacturers specify suitable for either system. The ordinary magneto or "local battery" transmitter will not prove satisfactory on a common battery system for any considerable length of time, as the granular carbon button must be changed. While some of the makers will change the carbon button, it is really preferable to make an arrangement whereby the entire transmitter is changed.

This leaves a receiver, induction coil, generator and two or three dry cells from each magneto set which cannot be utilized. It is true the receiver could be used if a common battery induction coil were used in the common battery set. But this is not advisable as the so-called direct current receiver circuit is efficient and much more simple. The common battery induction coil, furthermore, costs almost as much as the direct current receiver.

None of these parts has much salvage value. The receivers and generators can be put in stock and used, as occasion demands, in the country. The receiver cords of course, are used on the new telephones. The dry cells are junk.

By far the cheapest plan and all things considered, the best for the average small system, is the third plan (c). Consider the magneto telephone to have approximately the circuit shown in Fig. 2, page 557, TELEPHONY of October 12, 1912, which is a standard bridging circuit. To rewire the sets, it is only necessary to proceed as follows, supposing, of course, that a condenser is already installed in series with the ringer:

Disconnect the wires at the generator. The generator may be left in the telephone or removed, as desired, but it is better to remove it.

Tape each generator wire separately.

Remove the induction coil.

Substitute a direct current type receiver for the one on the set.

Connect the wires leading to the primary and secondary of induction coil.

Remove the dry cells, and short circuit the terminals to which they were connected.

If the magneto telephone has a condenser in circuit with the receiver, remove it and short circuit the wires which were connected to it.

The resultant circuit will be as shown in the accompanying diagram, Fig. 18, of a "converted" telephone, the old magneto equipment being shown in dotted lines.

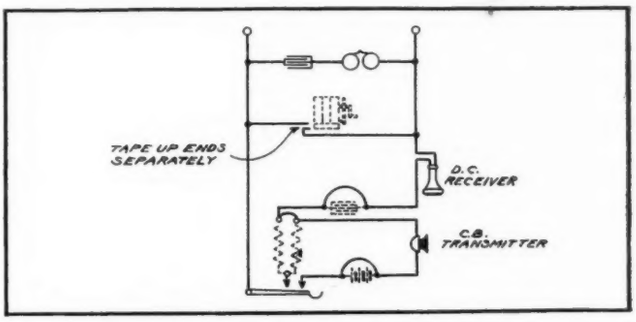


Fig. 18. Circuit of a Converted Magneto Set.

The cost of making a change of this character may be estimated as follows:

Condenser for ringing circuit	$0.50
Labor installing condenser	.20
Initial cost getting telephone ready for common battery service	$0.70

The installation of the condenser does not interfere with the operation of the telephone in any way. The old magneto switchboard may still be used. When the common battery board is placed in operation, the magneto subscribers' instruments will operate satisfactorily, but the dry cells in each telephone set will be in service, the talking current being derived from them.

To make the change to common battery complete, there will be required:

One common battery transmitter which, making allowance for the return of the magneto transmitter will cost	$1.00
One direct current receiver	.85
Labor in changing wiring	.35
Total	$2.20

Adding $0.70, the initial charge, the total cost of the change is $2.90 per telephone.

As salvage from each telephone there will be: 1 receiver, 1 generator, 1 set dry cells and 1 induction coil. While these have a doubtful value, at least $1 can usually be realized from them, so that the total cost of method (c) will be about $2 per telephone.

As the telephone is not removed from the wall, the labor cost is much less than with the other two methods. Furthermore, there is less apparatus unused and consequently less to be disposed of as junk.

Prior to the advent of the direct current receiver, it was customary to use a 2 mf condenser in common battery telephone sets, principally because it was placed in the talk-

ing circuit. While such a capacity gives good results in the ringing circuit, it is not strictly necessary and a one mf condenser may be employed, costing approximately 25 cents less.

In addition to installing the condenser in magneto sets, the installer at the same time should "pole" the receiver. That is, connect it in a manner such that when the common battery board is placed in service, the current will flow through the coils in a direction to increase the magnetism of the permanent magnet. To disregard this, will mean a permanent weakening of the receivers, which decreases their value and renders them practically useless for magneto work. The necessary equipment to aid in accurately "poleing" the receivers, will cost about $5 in addition to a voltmeter.

If carbon arresters are used at the magneto subscribers' stations, they should be carefully cleaned when the final change is made, so that dust particles will not cause trouble when the common battery current is on the lines. The gongs can be cleaned, and the cabinet rubbed with polish, thus making one trip cover everything necessary. Where old cords are utilized, they should be carefully inspected. If not of good quality and in good shape they should be rejected, as the common battery current will soon cause trouble, especially where the direct current receiver circuit is used.

As to the reasons why the old magneto transmitters and receivers cannot be used, it may be said that the transmitter may be used, but will probably "fry" and gradually become too noisy to permit of good conversation. This is because of the increased voltage of the common battery system, as compared with the 3 to 4½ volts of the local battery. The common battery transmitter is arranged for this increased voltage by providing it with a granular carbon adapted to withstand the increased voltage and changing the separation of the electrodes or carbon buttons in the transmitter cell. Even where there is no frying or objectionable noise, the magneto transmitter will prove inefficient, owing to its comparatively low resistance.

The regular magneto receiver may also be used, provided it is properly "poled" and that at no time is the line reversed. As the line may be reversed accidentally at any time, there is always danger of demagnetizing the receiver, which would then be inoperative. The magneto receiver, when used in this manner is inefficient and has a bad tone, being flat and dead.

It is therefore advisable to change the transmitters and receivers, even although some expense is necessitated.

Convertible boards necessarily employ visual line signals

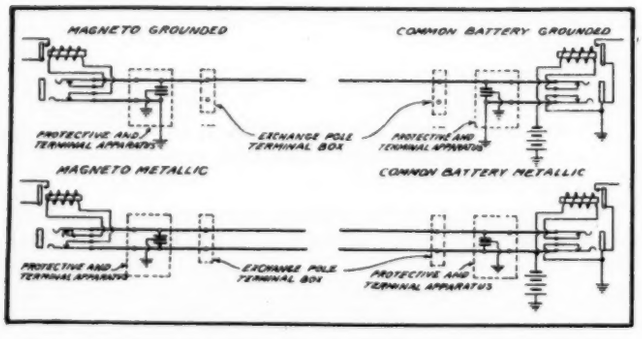


Fig. 19. Convertible Line Signals, Magneto and Common Battery.

instead of lamps. These signals are first employed as "drops" for the magneto lines, and later by a re-arrangement of the connections of the jack terminals, as line signals for the common battery lines as shown in Fig. 19. Usually this apparatus is of the self-restoring type, the drop being immediately above the corresponding jack. The cost of this kind of apparatus is but slightly more, probably ten cents per line, than that on a straight magneto board, and no additional equipment will be required when the change is made to common battery.

(To be continued.)

The Appraisal of Chicago Telephone Company.

Data regarding the Byllesby and Arnold appraisal of the Chicago Telephone Co., to which reference is made in the Prof. Bemis' report, has been made public. The complete report comprises ten volumes, having a total of 4,107 pages. Twenty-two sets of the report were made, the entire work being transcribed on the typewriter, using hektograph ink and the copies made by use of the hektograph machine.

It required an average of 160 men for 12 months, and then an average of 60 men for an additional 60 days, to complete the report. Work was started July 1, 1911 and was practically completed October 15, 1912. The Arnold Co. appraised the real estate, buildings and central office equipment. All outside property except as stated was appraised by H. M. Byllesby & Co.

In making this report it was necessary to appraise each foot of pole line and each substation, every foot of underground cable, conduit and every pole. To illustrate the magnitude of the task, it may be mentioned that 80 separate items were inventoried on each telephone pole.

The report shows that the inventoried property serves a total of 316,674 telephone subscribers, of which 251,741 are located within the city limits of Chicago, the balance being scattered throughout the suburbs in ten counties of Illinois, two of Wisconsin and two of Indiana. There are 33 exchanges within the city limits of Chicago and 95 in the suburbs, making a total of 128.

Keystone Report for October.

Following is the financial report of the Keystone Telephone Co., of Philadelphia, for October and the 10 months ended October 31:

REVENUE ACCOUNT.

MONTH OF OCTOBER.

	1912	1911
Gross earnings	$103,798	$97,724
Operating expenses and taxes	52,648	49,182
Net earnings	$ 51,150	$48,542
Less interest charges	25,256	24,954
Net surplus	$25,894	$23,588

EIGHT MONTHS ENDED OCTOBER 31.

	1912	1911
Gross earnings	$1,005,616	$969,639
Operating expenses and taxes	506,917	484,988
Net earnings	$ 498,699	$484,651
Less interest charges	$ 251,555	$245,704
Net surplus	$ 247,144	$238,947

University of Illinois Electrical Show.

The custom of holding a triennial electrical show at the University of Illinois will be continued and the next show is to be held on February 6, 7 and 8, 1913. It will be held in the electrical laboratory of the University at Urbana, Ill., and will be given under the auspices of the Electrical Engineering Society. The show as usual will be conducted by undergraduate students. Electrical and manufacturing companies will be allowed to exhibit. D. C. Wood is the general manager of the show.

Practical Subjects—Letters and Discussions

Letters from a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:—

When you told me in your last letter about that man's hat blowing off when he was up on a 50-foot pole, causing a bad runaway, I was reminded of what happened one day down in Bugville, Arkansas. Bugville wasn't much of a place to look at, but the corporation limits encircled considerable of a chunk of territory, as we set 64 poles inside the limits, and they all had to be forty-fives. There was one store, a blacksmith shop, etc., but no improvements to speak of.

We set a pole directly in front of the general store and post office, about ten feet from the building. It was a one-story frame shack with a glass front. Well, the last day we were there, the foreman had picked out a few odd jobs to clean up and Bud Whipple and I came along up by the store. I went in to get some tobacco, and Bud climbed the pole for something or other.

I don't know now whether he went up the pole or not, for things began to happen pretty fast about that time. I did remember afterwards that a grey horse was tied to the pole when I went into the store. I was just slipping my tobacco into my pocket when there was a sudden commotion in the front of the store. The whole front on one side of the door caved in and the grey horse came staggering back toward the middle of the room.

Something fell on him and he let go with both feet and sent the stove tumbling against the b:ck wall, where it was buried under a pyramid of flour. The old man behind the counter attempted to catch the bridle reins, but the animal shied and upset a counter and showcase. This caused him to dodge the other way and over went the counter and show case on the other side with the storekeeper underneath. In the mixup the horse somehow got turned around. Some one lammed him over the head with a gunny sack and he backed out through the other window.

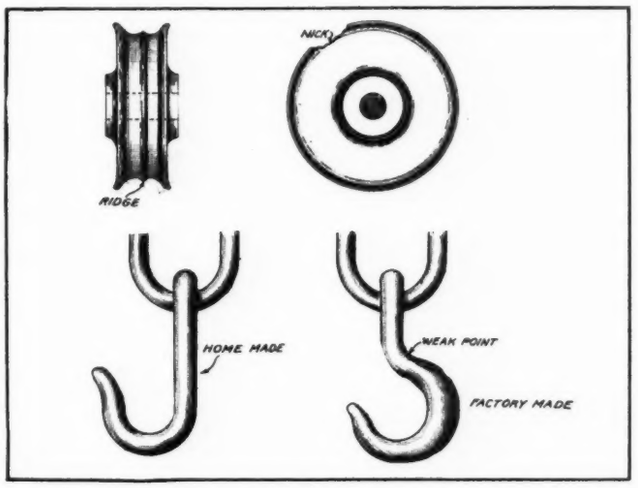
It seems Bud had started up the pole without asking the horse whether he cared and the horse was not agreeable. When I got outside Bud was gone and I did not see him again until we were 20 miles up the line. He lived in the woods during the interval. Bud allowed that the horse might as well have stayed on his own side of the pole where he had plenty of room to break loose without doing any damage.

Work cannot be carried on without causing some danger but it ought not to be due to carelessness as it was in the case I mention.

When all possible precautions have been taken to protect your own men, the public and property, you have done all you can. Keep a close eye upon the condition of your ropes and blocks, especially those in daily use. A bad block will cut the rope so gradually that it will not be noticed until the rope breaks. A pulley which cuts a rope should either be repaired or replaced by a new one. Rope is quite expensive but it is a great sight cheaper than arms and legs.

In handling your men, if you have any who are careless and can't be broken of it, better get rid of them, as sooner or later there will be a damage suit to settle. A man may think his life is his own and that he can run any risk he cares to, but that is not the case while he is working for someone else.

A well built telepone line along the highway is not exactly an ornament but it is not entirely out of keeping with the landscape. As for me when I strike a stretch of road without a pole line on one side, I feel that I am getting well away from civilization. It is rather interesting to me to look ahead along the road and see the poles and cross arms all straight and uniform. But if there's one arm set skew-gee or one or two poles on the bias, it spoils



Bad Pulley Wheels—Home and Factory Made Hooks.

the whole show, because I know that they could have been set right as well as wrong.

I presume it does not make much difference with the service over the wires whether the poles are in line or not. A line that stands true when loaded down with ice has the strain equalized. But if here and there a pole is out of line or a cross arm is tilted the strain is unequal.

If it wasn't for the long distance line that runs past the house, I don't believe I could stay here. The constant hum of the wires kind of steadies me. You'll get the same feeling if you stay at the business long enough. Most of the fellows traveling over the line put up here with us, and in that way I'm still in touch with the business.

It's been all-fired dry here and our bunch of lambs are not doing any better than they should, but I guess by next spring we will figure some profit. By the time I smoke another pipe it will be bed time for sure.

Your Uncle Dick.

Poor Connections on Subscribers' Sets.

Trouble on badly soldered joints is very hard to locate. Some, I am sure, are never found and the telephone works on with poor service.

A case of trouble came up on our exchange, which is magneto, and a lineman was sent out to clear it. At the subscriber's station, he found everything apparently in good order, but on taking down the receiver found that he got no battery at all. After examining all connections, he gave it up and brought the telephone in for repairs.

The set was of the old style, the induction coil being located in base of transmitter arm and all connections were made to six binding posts at the bottom of bell box. All circuits were soldered on the ends of the binding posts and the wires run in grooves in the back of the set, so when the bell box was in its proper place, all wires were concealed. I thought that the trouble was perhaps in the transmitter or a broken wire in the battery circuit, and would be very easy to locate. But not so, for I used a ring current to test with and every circuit came up fine.

As I had found trouble before in badly soldered joints, I

proceeded to take off the bell box and examined the joints. They were all apparently good, but still I got no transmitter where they were connected up. I had been in the telephone business a long time and always found my troubles very easily, but this one bothered me a great deal. I began to jar the bell box with the circuit crossed out and the receiver to my ear and at last got just one h'gh sound. Upon examining the soldered connections on the ends of the binding posts and pulling very hard the wires came off. Of the six posts the connections on five were in bad shape. There was so much resin that the wires did not make a good contact. I could ring through all right, but could not get a battery connection through.

I would much rather have a twisted joint than a badly soldered one, for the latter gives very bad transmission, although there is nothing as good as a well soldered joint.

Carrollton, Ga. C. M. Hamrick.

Wide Foreign Distribution of Telephones.

The wide distribution of American manufactures is illustrated by some recent figures of the statistical division of the Bureau of Foreign and Domestic Commerce, showing the variety of articles exported and the numerous countries to which they are distributed.

American telephones and telegraph instruments went to such distant places as British Africa, Egypt, Australia, New Zealand, the Philippines, Java, Brazil, Korea and the Canary Islands.

The value of scientific instruments and apparatus, including telephones, telegraph instruments, etc., exported last year was over $13,000,000, and the countries to which they were sent, approximately 90 in number, were located in all parts of the civilized world. Practically $1,000,000 worth went to Cuba, $4,250,000 worth to Canada and $1,500,000 worth to the United Kingdom.

Among the other countries and communities to which they were distributed are Siam, Portuguese Africa, Ecuador, the Straits Settlements, Egypt, Trinidad and Tobago, Peru, Asiatic Russia and Bolivia.

Unusual Methods in Repairing Telephone Lines.

A small mortar for use in shooting a life line to a wrecked vessel was utilized by a telephone repair crew near Los Angeles, California, to get their wire across a river. The stream was one of the sort which is very common in dry countries; a bed of sand throughout the summer and raging torrent after a heavy rain.

One rainy season it washed away the long distance telephone line and there was no way to cross the swollen stream to repair it. A boat could not safely be used with such a current, while quicksand and rolling boulders made it hazardous for a horseman to attempt to ford it. The problem was solved by a message to the nearest beach where a life saving station was located. The small cannon, life line and a can of black powder were sent to the river bank, where the gun was charged and aimed to shoot the line across the stream.

Preparing to Shoot the Rope Across the River.

The result of the explosion was successful, for the projectile carried one end of the coil of rope more than a 1,000 feet to the other bank. The telephone wires were attached to the other end of the rope and hauled across the water by men on the opposite side. The line was quickly repaired and service was resumed in short order.

A mortar of similar design, mounted on an automobile is to be used as part of the repair outfit in the future, according to the foreman who carried out this unique plan.

Los Angeles. L. M. Edholm.

To Teach Telephone Practice.

"Telephone Principles and Practice" are now to be taught by the Superior, Wis., branch of the university extension department.

T. M. Johnson, of the local extension branch, who is in charge of the organization of the class, announces that the course will consist of twenty weekly class meetings and will treat of the "fundamental principles; talking and signal equipment; magnetic instruments, circuits and switchboards; line system; batteries, testing apparatus; line and cable construction and the automatic telephone."

Sighting the Cannon, Note the Rope in Muzzle—The Coil of Rope Unwinding as It Was Carried Across River.

The Telephone Inspector and the Troubleman

The Thirteenth Installment of a Series of Articles Which Deals in an Elementary Manner With Many of the Problems Encountered in the Operation of Small Exchanges—Stringing Wire With a Running Board

By A. E. Dobbs

"Once while I was working in Vermont," said George. "I surveyed a line over a hill, and we would call it a thunderin' big mountain here. In laying out the route, I struck a solid ledge of granite three miles long where we could find no dirt more than a foot in depth and I tell you the idea of digging all those holes with dynamite was appalling."

"It must have taken about five sticks of dynamite to dig each hole," interrupted Johnston.

"No! Didn't take any."

"How in thunder—?" began Johnston.

"Went four miles out of our way to get around the hill," ended George.

Johnston was too disgusted to even laugh.

"Those four miles of extra construction would have paid for several tons of dynamite."

"Well, we made it pay by picking up several extra subscribers whom we did not contemplate reaching in the first place."

"But, joking aside," went on George, "I think it would be just as well if you should turn your gang over to Tom in the morning and come with me. We will do a little cross guying and mark our transposition poles, for we must do that before we string wires in order to know where to cut them off."

"I see! You intend to string these wires with a running board?"

"Yes, we intend to use a running board. The blacksmith has finished drilling the holes in an iron bar and I'll fix it up something like this. (Fig. 29). While we are about it, we will also put on the transposition insulators where they belong. Up to this cross-road, we will have three circuits on the top arm and four on the bottom. Of the top arm, two of the circuits will be copper as already planned, while the third is an extra one of No. 10 BB iron, intended for local service only, between our office and Northville. The farmers' lines will all be placed on the second arm."

"Since you have but three circuits on the top arm, why would not a six pin arm have done just as well?" questioned Johnston.

"Because that top arm will be filled sooner or later, and perhaps sooner than you think," replied George. "But coming back to our subject, two of the circuits come to this road. The one runs north and the other south with an extension to Buck Creek swamp, where we leave the farmers so far as our exchange is concerned; the rest of them must connect with Northville. Of course any wires that go on our pole line, we will string ourselves, for we don't want linemen whom we do not know and have no control over, stringing wires on our poles. Hence it is possible that we may have to string some wire for the other people."

Stringing the Wires.

Leaving Tom to finish the pole lines on the spurs, or branch lines, Johnston went back with George. The next day they put head guys on the main line at mile intervals, as well as cross guys every second mile up to the cross road corner, including guys at the Buck Creek hill. They also placed transposition insulators of the double skirt pattern on the poles where transpositions were to be made. Two days later the wire stringing actually began.

When the manager saw the running board that George had fixed up, he was inclined to demur.

"Why," he said, "your men will have to climb those poles twice in order to tie in the wires. Besides, they cut into the arms in passing over them."

"As to your first objection," answered George, "we always save time by this method where there are five or more circuits to pull out, as you will presently see. The man who passes the wires over the pole next to the reels, protects the top of the arm with a piece of wire run across the top so that there is no wear on the arm at that point. The wear on the other arm is not great enough to amount to anything. As far as the extra climbing is concerned, we well know that climbers cannot handle more than four wires at one time. At that there is constant trouble from the wires getting crossed behind them, all of which delays the gang. With a running board, there is no trouble of that kind, as the wires do not become crossed so easily, and if they do, their constantly forward motion clears them out as the cross approaches the next pole."

"When transposition poles are reached," continued George, "the wire ahead is simply fastened around the arm. The man pulls back all the slack he can by hand, and likewise ties it around the arm. This leaves every wire in its correct position. The reel wagon is then driven half a mile ahead, where the process is repeated in the next section. There is no stopping for the gang to pull up wires. The reels are mounted on a wagon, and a horse ahead attached to a long rope does all the pulling. When the wires are all pulled out, the groundmen

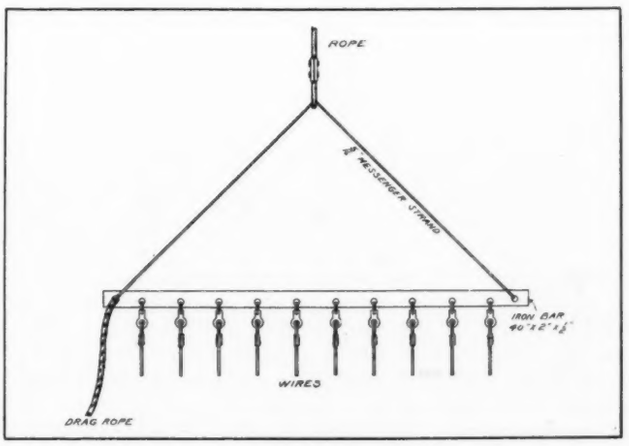


Fig. 29. The Running Board.

are then set to work doing something else, or they can be laid off. The climbers are then put to work pulling up slack. That is done in half-mile stretches, so that there will be absolute uniformity, and transpositions are made at the same time. The men can then work their way back, tying in wires for the insulators on the rest of the poles."

"But you have seven circuits to string," interposed Mr. Risk, "and you are only pulling out five."

"True," replied George, "but if you will notice the arrangement of that running board, you will see that there is one

wire on the road side for the second arm, six wires for the top arm, and three more wires for the field side of the second arm; and these wires will be thrown down into place as fast as the running board passes the man on the pole.

"I have placed as many wires as possible on the field side because they are harder to reach on account of the fences. But even at that, there will still be one circuit on the field and one on the road side. When we get these wires pulled through, as we will today, the groundmen will have to carry the reels through the fields. We will delay that until these wires are pulled up, unless it so happens that you have nothing else for the groundmen to do. In that case, we will go back over the line and pull all the wires through, up to the last stations along the straight road, as both of these circuits will end before we reach the cross roads."

By this time the first half mile had been run out and the iron wire reels were empty. George then directed the man on the pole to take three or four turns around the arms that there might be end enough for a transposition without cutting or splicing. What remained of the copper wire coils was cut off and reeled up again and the wagon moved ahead.

"There!" exclaimed George, "you see that bunch of wires went through without a hitch and they are pulled up in good shape, so that when the men put on their 'come-alongs' there will not be the slightest trouble."

"But you left some of that copper wire on the reels, which will make an extra joint," complained Mr. Risk.

"Well," responded George, "we are arranging our work so that we will not have to make so many joints at transposition poles, where it is common practice to make four or six instead of two."

"Will not those joints catch on the arms as the wires are pulled up?"

"Not if we tie a piece of string or a piece of tape ahead of them, as we intend to do. Treated in that way they will drag right over," replied George.

"What do you do when your coils of wire get snarled? I notice that you have ten coils on five reels," queried the manager.

"Wire pulled off the reel does not snarl if it is started right," George rejoined. "I have instructed the man with the team to be sure and pull off 20 feet or so in order to be certain that the end is free. There is no trouble after that if the reels are watched to see that the wire does not fly over the top."

They had driven ahead and once more George was giving directions to the men.

"All the transpositions do not end at this pole," said Mr. Risk.

"What of it?" answered George rather crossly. "Can't we make connections here and pull the slack back to the place where the transpositions are made? I wish you would leave those details to me, and at present I really ought to keep my mind on what this gang is doing. I can promise that you will be satisfied with results. I have been working on these problems for some two or three weeks now, and my fifteen years of actual working experience ought to count for something."

"Oh, you are all right, George, but you are doing something I never saw done before and I wanted to know all about it," said Mr. Risk. "As you know, I have a slight interest in this plant, something over a majority of the stock, and it is my duty to know what is going on."

"Of course, I was not trying to conceal anything from you," George replied. "Although I have no stock in the plant, I have my reputation to sustain. It is all I have got and it follows that I would not be likely to commit any blunders, if I knew how to avoid them. But I spoke hastily, nor must I forget that you have given me a few good ideas of your own. I was somewhat impatient, owing to the fact that while we have one or two experienced men, the others have to be told everything, and that requires watchfulness on my part."

"Of course you are superintendent, and I do not wish my questions to be taken as a desire on my part to interfere with your management of the crew. But I have trouble enough explaining my management to the rest of the directors, occasionally, for they are not telephone men, and if they saw this, they would want to know all about it," said Mr. Risk.

"I should think it would tickle them to see five circuits strung five miles in one day, even if they are not tied in," George responded, slightly mollified.

They reached the cross roads that day before quitting time. The next morning George told the men to string out the other two circuits; the one on the field side to be carried out as far as the house behind the long row of shade trees; and the one on the road side to stop about a mile nearer the exchange. They were not to be tied in, except at each half mile transposition pole, as in the case of the other circuits strung the day before. It was necessary to have four men carry two reels through the fields, while the other two reels were mounted on the wagon. Each man who climbed was to carry up four wires at a time and keep them clear behind him. The reel carriers were to pull up the slack as the men climbed the poles so as to keep the wires clear of the ground.

At the close of that day the last two circuits were completed. Two or three days later the wires were all extended to Northville and connected to the toll section of the new exchange. George was then ready to go back and finish the line by tying the wires to the insulators. Before doing this, he directed Tom and Will to take four groundmen for carrying the reels and to string out the wire on the spur lines.

"And be sure that you head-guy the last poles on those spurs, so that we will have no slack wires to pull up next spring," he added as a parting injunction.

(To be continued.)

Progress on Telephone System in Constantinople.

The Journal of the British Chamber of Commerce of Turkey says that the Société Anonyme Ottomane des Téléphones de Constantinople expects to inaugurate its service in Constantinople by the end of August, 1913, which is within the period specified in its convention with the government. The company has now a technical staff of some 30 persons engaged in supervising the laying of its lines. It has to date some 5,000 km. of cable, 3,000 km. of underground wire, and 30,000 km. of piping in position.

The installation will be underground in the city proper, to Bebek on the European, and to Scutari on the Asiatic shores of the Bosphorus, and in Frinkipo, the largest of the Princes' Islands. The company has to date received subscriptions for 2,101 stations, representing an annual income of £T15,000, which is in excess of its own estimates of subscribers as the work progressed. Of the subscribers 22 per cent. are purely Turkish. The company has imported from Great Britain 10,000 km. of cable, 10,000 km. of wire and 23,000 pipes, which has been cited as bearing out the economic principle of commerce following capital.

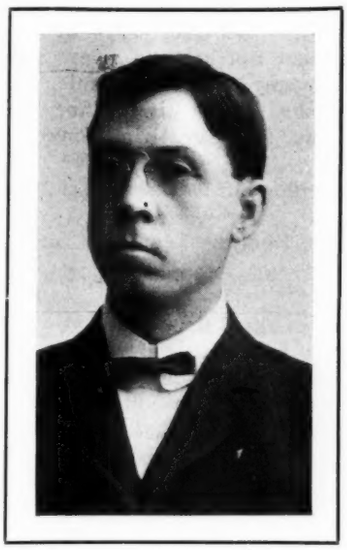
Asks Company Twenty-four Hour Service.

The Public New York Service Commission, has served upon the Earlville Telephone Co., of Earlville, the complaint of John R. Parsons, president of the Earlville Electric Light Co. This complaint asks that the telephone company have its switchboard in continuous operation or extend the service from 5:30 a. m. to 10 p. m. every day instead of the present service from 7 a. m. to 9 p. m. daily and one hour on Sunday morning and on Sunday evening.

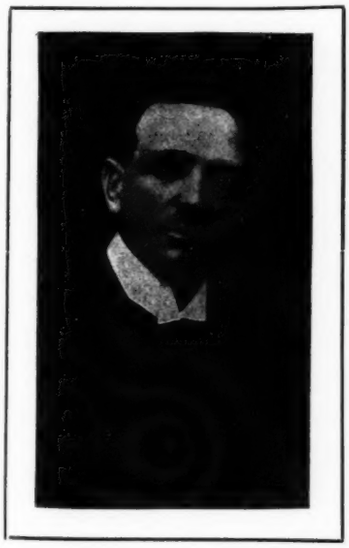
Other allegations of the complaint refer to the overloading of the company's line, pointing out that in several instances there are from 12 to 19 telephones on one line; also the company's lack of modern equipment, making it difficult for persons to be heard one mile apart.

A Quartet of Men Prominent in the Telephone Field

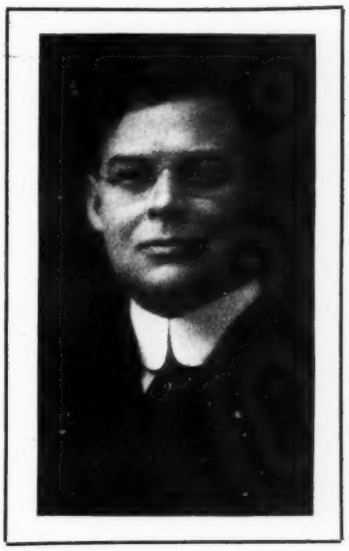
ARTHUR BESSEY SMITH, electrical engineer for the Automatic Electric Co., Chicago, and also engaged in private practice, was born in Altoona, Iowa, August 10, 1875. Following a normal school education, he graduated from the University of Nebraska in 1901, with the degree of B. S. in E. E. In 1907, he graduated from Purdue University, with the degree of E. E. He is an associate member of the A. I. E. E., a member of the Society for the Promotion of Engineering Education and a Sigma Xi. He is also a member of the I. O. O. F. Mr. Smith entered the telephone field in 1893 doing elementary work. From 1895 to 1901 he was attending the University of Nebraska; in 1901-2 he was lineman and repairman at Missouri Valley, Iowa; then inspector in Omaha and later local manager at Tecumseh for the Nebraska Bell; from 1903 to 1905 he was assistant manager for the Woodbine (Iowa) Telephone Co.; during 1905 he was engineer at Amsterdam, N. Y.; he was professor of telephone engineering at Purdue from 1905 to 1909, when he went with the Automatic.



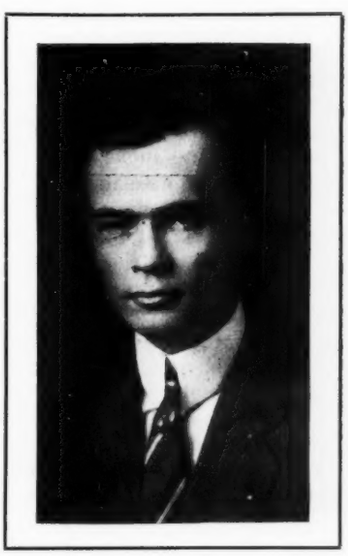
WILLIAM J. THILL, manager of the Independent Toll Clearing House, Des Moines, Iowa, and secretary of the Iowa Independent Telephone Association, was born in New Albin, Iowa, July 29, 1875. He farmed until 18 years of age, later clerking in a shoe store until the outbreak of the Spanish-American War, when he enlisted in Company I, 49th Iowa Infantry, serving 13 months, in Cuba and elsewhere. After his discharge he was deputy sheriff of Allamakee county, Iowa, about two and a half years, resigning to become deputy county treasurer, which post he held approximately a year and a half. In 1904 he was given charge of the properties of the Interstate Telephone Co., with headquarters at Dubuque, Iowa, of which he was superintendent for two years. In June, 1906, he took charge of the Clearing House and reorganized it, continuing as its manager ever since. He was elected secretary of the Iowa association in March, 1907, and has since been re-elected each year. Mr. Thill is a member of the Independent Telephone Traffic Commission, of the K. C. and the M. W. A.



BYRON L. MOORE, secretary and general manager of the Century Telephone Co., Buffalo, N. Y., is a chemist by profession, having held important positions in that line for some time prior to entering the telephone field. In 1900 he associated himself with the Century company, later becoming purchasing agent for the Inter-Ocean Telephone Co. In 1905 he assumed charge of the territorial exchanges of the Inter-Ocean, the following year taking up organization and development of Independent exchanges and increasing of traffic generally. From 1908 to November, 1912, he was secretary of the Federal Telephone & Telegraph Co., at the head of the commercial department, devoting himself to similar development work. This position he resigned to go with the Century. He is also secretary of the Consolidated company, president of the Directory Publishing Co. and an officer and director in various Independent concerns. Mr. Moore was born in Dwight, Ill., November 1, 1869. He graduated from the University of Illinois in 1890, with the degree B. S. in chemical engineering. He is a Mason and a club man.



JAMES E. MOONEY, superintendent of equipment for the Citizens Telephone Co., Grand Rapids, Mich., was born in Grand Rapids August 27, 1877, and educated in the parochial schools of that city. He entered the employ of the Citizens Telephone Co. in 1896, as helper. In January, 1898, he became superintendent of the Kalamazoo Mutual Telephone Co., Kalamazoo, Mich., where he remained until his enlistment during the Spanish-American War. There he served in the Telegraph Corps of the Signal Service, in Cuba and Porto Rico. In 1899 he again took up telephone work, this time as superintendent of the Calhoun County Telephone Co., Battle Creek, Mich., returning to the Grand Rapids Citizens the following year, in charge of switchboard equipment. When the company installed the automatic system Mr. Mooney was given charge of the switchboard. In 1910 he was promoted to his present position of superintendent of equipment. His experience in the telephone business has been very comprehensive along mechanical and technical lines. He is a K. C.



Sparks from the Troubleman's Department

Mr. Dooley Goes Out with Troubleman Reagan.
(With Apologies to F. P. D.)

"Hinnessy," said Dooley, as he blew the foam from a bucket of suds, "Did yez iver run around wid a tilifone trouble man?"

"No," said Hennessy. I niver did."

"Well," said Mr. Dooley, "I did. It was whin I wint back East wid the A. O. H. at their conferince, a worrd which yez can not understh-a-nd wid yer limited eddication, Hinnessy. Ye will, perrhaps, raymimber Tim Reagan, me wife's cousin's brother. Well—'tis the iligant job Tim has back East wid the tilifone company. He is a throuble man. He has no throubles himself, he is the man what fixes the throubles wid other people's tilifones, thim they call subschribers. Whin I was up in New Hiven, Connecticut,—but, Hinnessy, that is the grand place, wid Yale University, where they tach ottymobilin' and fwat to ate and dhrink, especially dhrink, and Savin Rrack, phwere they is merry-go-rhounds, and pitcher shows and gyrruls, and Lighthouse Point, phwere they has ball games and bicycle races—I shtopped wid me wife's cousin.

"Wan day Tim he says to me, says he, 'Come wid me to worruk to-day and see how we raypairs the tilifones.' So me and Tim wint down to the wire chief's office and they handed Tim phwat he called throuble tickets. 'Git to hell out to Missus Smith's,' sez the wire chief, 'and git her tilifone goin' or the owld leddy will call Misther Moran and yez will all git the can.'

How the York (Neb.) Installers Work Football Day.
(By One of Them.)

"Well, we come to a grrand house on a wide avenoo, and Tim goes around to the back door and rings the bell. A nice gyrrul comes to the door and says, 'Good marnin', Tim, have yez come to fix the tilifone, and will yez have a piece of pie?' 'Wait till I goes down cellar and looks at the arreshter,' says he. 'Tis in the same place nixt the wine closets,' says she. 'I know ut,' says Tim. 'Come on Dooley.' So down cellar we goes and Tim takes the tops off two bottles av beer wid his pliers. 'Now,' says he, 'we'll feel like eatin that pie.'

"Afther we had ate the pie, apple it was, wid cream on ut, the gyrrul takes us up sthairs phwere the tilifone was. Tim takes the raycayver, which is the parrt yez put to yer ear, Hinnessy, off the hook, which is phwat yez hang it on, and jiggles it up and down. 'Nothin' doin',' sez he. 'Bhring me a candle so that I can see.'

"Phwile she was gone, he monkeys wid the thing wid his pliers. Whin she come back, he took the candle and looked the tilifone all over and unlocked the little door in ut. Thin he takes off the raycayver and says, 'wire chief.' Afther a few minuts he says, 'Throuble tickut four wan wan four four O. K. at nine fourty-five.'

"A nice ould leddy thin comes out into the hall and says, 'Good marnin', Mister Inspector, was there very bad throuble wid the tilifone?' 'Very difficult to find, mam,' says Tim, 'the indhuction coil was crossed wid the thransmitter.' 'Goodness,' says she. 'Mary, give the gentleman and his friend a piece of pie. They'll be tirred afther their harrd worruk.' 'Thank you, mam,' says Tim.

"Tim," says I, whin we had ate our second pace of pie and were goin' up the avenoo, "was phwat ye said the throuble wid the tillifone?' 'Nit,' says he, 'the corrd had fell out of the bindin' phost.' 'And phy,' says I, 'did yez tell the leddy phwat yez did?' 'Because," says he, 'it makes thim think yer an efficient worrker and gives thim confidince in the tilifone company, which a simple explanation would not do,' says he. Shure 'tis the fine job Tim Reagan has got back East in New Hivin, Connecticut."

"And will yez go into the tilifone business?" said Mr. Hennessy

"Not if I know ut," said Mr. Dooley.—Telephone Bulletin.

A Pessimist's View of the Telephone.

The telephone is a modern instrument of torture invented to prevent people from thinking continuously. Its principal object is to cut us off from the people whom we desire to know and to force us into contact with those whom we do not care to meet. To get away from the telephone is impossible. To associate with it is madness. It is a new power in the hands of the bore.

The great difficulty in getting away from the telephone is the fact that there is always the possibility that someone whom you really wish to talk to will call you up. This possibility makes you easy prey for anyone else.

The telephone is the most discourteous instrument ever invented. It does not even knock at the door. It does not send you word in advance that you are wanted. It breaks in upon you in the most insulting manner and at the most critical points.

The only way to prevent its machinations is to provide a license only for those people who are proper persons to talk over the telephone. Nobody ought to be allowed to use it except certain people who are fitted by Nature and temperament to do so; and these should be subjected first to a strict examination.

At present, anybody can use a telephone. Any fool is likely to call you up from anywhere at any moment. Each one of us is, therefore, the victim of indecent mental exposure. Utterly defenseless, we are unable to cope against this new enemy.—Life.

"Yes," said Mr. Jones, when a certain girl's name had been mentioned, "I know her to speak to, but not by sight."

"You mean," cut in the prompt corrector, "you mean that you know her by sight, but not to speak to."

"No, that isn't it. I never saw her at all to know her, but I speak to her nearly every day."

"How can that be?"

"She is the telephone girl at the exchange."

Queries on Theory and Practice

Transposed Grounded Lines Will Not Stop Induction.

"I would be glad if you would explain to me how to transpose grounded lines. We have a number of grounded lines and have a lot of induction on them. We also have drops in our switchboard fall when other lines ring although they are not together."

The transposition of ground return lines comes up now and then in spite of all that has been written. No scheme of transposing single wire circuits can stop cross talk or induction from other disturbances. The best that any transposing could do would be to equalize the cross talk on all so that no two would hear each other better than the rest. Practically it will not do enough good to be worth the trouble.

The falling of drops when other lines ring may be due to a bad ground at the switchboard. Spare no pains to make this ground good. Remember that the ultimate object of the ground rod or connection is to make a very low resistance path into the earth. You may have ever so good a wire and rod, but if the surface of the rod is in contact with dry dirt, the resistance will be high and cross ringing of drops will result. Broad surface in moist or wet earth is what counts.

Best Method of Connecting Two Magneto Switchboards.

"Will you kindly advise me as to the best way of connecting two switchboards? We have a 200-drop magneto switchboard and its capacity is exhausted. We have purchased another 150-drop board of the same make and wish to connect the two so that one operator can work both boards with only one transmitter and receiver. Would it be all right to jump a pair of wires from taps of the listening keys of one board to the same taps of the listening keys of the other board, and do the same with the ringing?"

Your idea is correct, but there is one precaution which should be observed, especially if you have any grounded lines on the board. This is to connect like terminals of the operator's listening strip to each other, so that when the listening keys are thrown, the same side of the operator's circuit will be connected to the tips of the plugs on both boards. Fig. 1 will make clear the idea.

The old board is at the left, with the listening strip terminals marked. The right hand terminal wire runs to the springs on the listening keys of the old board which come into contact with the tip side of the cord circuit when the key lever is thrown. This terminal should be connected to the *T* terminal of the new board, and the two *S* terminals also wired together.

The effect of getting the jumpers transposed, is to short

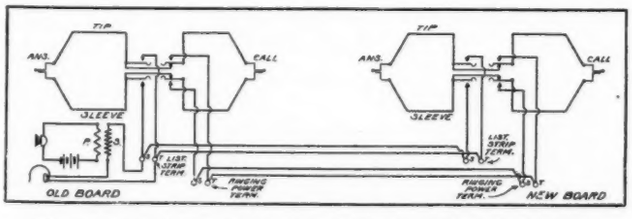


Fig. 1. Circuit for Connecting Two Magneto Switchboards.

circuit the operator's telephone set if she tries to listen in on two cords at the same time. Fig. *2A* shows the conditions. The telephones *TT*, are connected by skeleton cord circuits, with the tip and sleeve marked. The right hand terminal of the operator's telephone runs to the sleeve of the upper cord, and to the tip of the lower cord. This will make no difference as long as the operator listens in on only one cord at a time. But, as in the sketch, if she gets in on two cords on different boards at the same time, the right terminal will be grounded at the upper cord and the left terminal at the lower cord.

The transposing of the jumpers for the ringing current

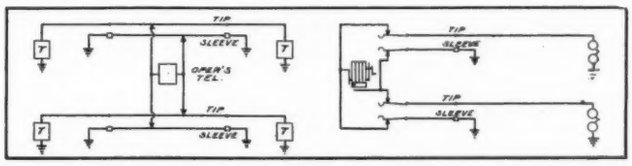


Fig. 2. Effect of Transposed Jumper and Crossed Jumper.

will have a similar effect, as shown by Fig. *2B*. If the operator rings on the two boards at the same time, the right hand terminal of the generator will be grounded at the upper cord, and the left hand terminal grounded at the lower cord.

Time Efficiency of Lines and Apparatus.

"What is meant by the 'time efficiency' of apparatus and lines? How should it be figured and what good is it?"

The time efficiency of anything, telephone or otherwise, is the ratio between the length of time which it is used and the length of time which it might be used. If a toll line is actually in use 40 minutes out of every hour and lies idle the other 20 minutes, its time efficiency is

$$\frac{40}{60} = 0.667 = 66.7 \text{ per cent.}$$

Time efficiency may be either gross or net. Using again the example of a toll line, there may be considerable difference between the time during which the line has either an operator or a subscriber on it and the time for which payment is made. This is due to our system of charging only for the actual conversation period. Thus, while the gross time efficiency may be 75 per cent., the actual or net time efficiency may be as low as 50 per cent.

The usefulness of calculating time efficiencies lies in the economies which may be made thereby on account of the leaks which it uncovers. Many times the manager of a telephone company will think that all parts of the plant are operating at their best, when the reduction of their performance to an efficiency statement would show him how inefficiently some of them are being used.

Telephone lines and apparatus are notably inefficient as regards time. The subscriber's line and apparatus are the worst. Many residence telephones are used only five times per day and the average conversation may not be more than two minutes, making a total time for the day of ten minutes. Since there are 1,440 minutes a day, the time efficiency is

$$\frac{10}{1440} = 0.007 = 0.7 \text{ of } 1 \text{ per cent.}$$

The other extreme is found in some European toll lines, where charges are made for the time during which the line is ready for the call specified. The gross efficiency during the busy hour of the day rises as high as 92 per cent. with a net efficiency of about 83 per cent. Of course this high efficiency can not be maintained during the slack portions of the day and during the night, so that on the whole, the 24-hour time efficiency is small.

Abstract of Report on Situation of Chicago Bell

An Investigation Made for the Chicago City Council Committee on Gas, Oil and Electric Light to Furnish Data Upon Which to Base New Telephone Rates for Five Year Period, as Prescribed by City Ordinance—Last Installment

By Prof. Edward W. Bemis

POSSIBILITIES OF REDUCTION.

It has appeared that operating expenses should not include more than $1 per telephone for payments to the national company. It has also been shown that the station removals are very high, but that in 1912 they were beginning to fall. The repairs, which averaged about 6.5 per cent., 1904-7, fell to about 5.5 per cent. during the next four years, 1908-11. The average, however, of all the Bell companies last year, was under 4 per cent. of the investment. It was under 4 per cent. also in the largest cities outside of Chicago. Local conditions may prevent for awhile a further reduction here, but it is reasonable to suppose that the present 5.5 per cent. will approach 4.5 per cent. and the station removals, which are now about 2 per cent. in the city, will decline to 1.5 per cent.

The entire expenditure for repairs, renewals, station removals and additions to the depreciation reserve is over 13 per cent. of the average investment in the city, as compared with 8.5 per cent. to 9.5 per cent. on the average elsewhere.

Repairs and renewals have been steadily falling from about 9.5 per cent. twenty years ago to 7.39 per cent the last three years, ending with the close of 1912. The appraisal has shown that a further expenditure of 1.86 per cent. annually of the property subject to depreciation would result in the accumulation of the $5,091,000 actually collected.

Furthermore, this amount still leaves the investment intact, although about $10,000,000 of the appraised values of Byllesby and Arnold were rejected. If this $5,091,000 of depreciation in the property had been accumulated by setting aside yearly a percentage that should decline with the decline in maintenance, then the percentage would have started during the seven years, 1891-7, with 2.77 per cent., would have fallen during the next seven years, 1898-1904, 2.06 per cent., and during the last seven years, 1905-11, would have fallen to 1.66 per cent. with every prospect of a further decline below 1.5 per cent.

From this point of view, one could estimate the repairs and renewals, known as maintenance, at about 7.4 per cent., or at the most 7.5 per cent., during the next two years, with a further addition to the reserve fund of 1.5 per cent., making a total of 9 per cent. for maintenance and depreciation. This is aside from the expense for station removals and changes, which keep the installation of wires and fixtures inside the subscriber's premises intact, and practically free from depreciation.

The matter may be approached from another point of view. We may assume that the average repairs for the next five years will be 5 per cent. and the amount necessary for the depreciation reserve 1.5 per cent., making a total for these two items of 6.5 per cent., with a possibility of 7 per cent. There remains the problem of renewals. From figures prepared by the company it appears that with an average life gradually increasing from twelve years in the 90s to 19 years now, and with a very moderate rate of growth, giving an investment of $103,000,000 in 1930, the renewals for the next five years, 1913-17, would average 1.78 per cent. of the depreciable property, and during the following thirteen years, 2.88 per cent. The addition of 1.78 per cent. for renewals to the 6.5 per cent. to 7 per cent. already mentioned for repairs and depreciation reserve, would give 8.28 per cent. to 8.78 per cent. for repairs and renewals and for an addition of 1.5 per cent. yearly to the depreciation reserve. During the remaining thirteen years, the repair item might be estimated at 4.5 per cent., which is still much higher than in other companies. This, with 1.5 per cent. for the reserve, and 2.88 per cent. for renewals, would be 8.88 per cent.

Description.	With Maximum Expenses.	With Minimum Expenses.
Operating expenses	$ 7,584,289.80	$ 7,584,289.80
Excess payments to A. T. & T. Co.	.....	191,818.00
Expenses less excessive rentals	7,584,289.80	7,392,471.80
Expenditures for repairs and renewals	1,836,506.60	1,836,506.60
Expenditures less repairs and renewals	5,747,783.20	5,555,965.20
Add for corrected repairs, renewals and depreciation	2,395,976.35*	2,266,464.12†
Revised expenses	8,143,759.55	7,822,429.32
Receipts	10,410,770.59	10,410,770.59
Profits	2,266,011.04	2,588,341.27
Conceded profits	1,765,995.00‡	1,513,710.00¶
Remaining profits	501,016.04	1,074,631.27
Contingencies and surplus	150,000.00	100,000.00
Possible reduction in rates aside from consideration of claims for extraordinary depreciation	351,016.04	974,631.27

*At 9.25% of average depreciable property new of $25,902.447.
†At 8.75% of average depreciable property new of $25,902,447.
‡Taken at 7% of $25,228,500, the latter being equivalent to such a per cent. of the $6,000,000 of bonds and notes and $27,000,000 of stock as the total of appraised property in the city, new, was to that in the city and suburbs.
¶Estimated at 6% on $25,228,500, the city portion of the property.

Table No. 19. Revised Expenses and Profits Within the City in 1911.

The telephone company does not accept as long a life today as 19 years. The appraisal, however, used estimates of life which amount to a composite life on all the property of almost exactly 19 years, viz., 18.961 years. It seems certain that the whole tendency in the Chicago plant is toward reaching in a comparatively short time, the age adopted by Byllesby and Arnold, if that time has not yet been reached.

Byllesby and Arnold find that the average depreciation allowance on a straight line basis is 4.068 per cent. If, however, they had taken the allowances for salvage which have been found by the Chicago company to be applicable to its condition here, the salvage would have been raised from 22.862 per cent. to 29.234 per cent., and the annual depreciation and renewal allowance on a straight line basis on all the plant in service, including land, but not including working capital, construction in process, tools, teams, furniture and fixtures, would have been reduced to 3.732 per cent.

With the almost certain continuance of the increase in cost of labor and materials and of other increments of value that are often allowed in appraisals, the rate of depreciation and renewals may be kept down to between 3.5 per cent. and 4 per cent., as we have seen has been the experience of the last 20 years. Everything points to an allowance for maintenance and depreciation of 8.5 per cent. to 9.5 per cent. At 9 per cent. the company could continue to pay 5.5 per cent. for repairs during the next five years, meet all renewals that would come on the assumption of a 19-year life, such as was used by Byllesby and Arnold, and would have 1.72 per cent. for a depreciation reserve or other extraordinary expenditures, or almost as large an amount as the 1.86 per cent. of the last 20 years.

As already observed, this percentage might well decline with the decline of the maintenance account and be taken at 1.66 per cent. during the past seven years.

With the data at hand and the conclusions already reached above, the operating expenses in the city for 1911 might be thus treated (Table No. 19):

The above figures do not take into account the claims for extraordinary depreciation brought to the writer's attention during October, in which month the report was being put into final shape. Attention will be given to it in the pages immediately following. Aside from that item the conclusions from the above table would be that a reduction in the telephone rates of about $700,000 could be fairly made.

Toll Earnings and Expenses.

All the expenses of the toll business in the city are included in the operating expenses of the city exchange. The toll revenues include all the money apportioned to the city by the company. A careful investigation of the subject by Mr. Hall confirms this apportionment, which is like that made by Arthur Young & Co., accountants, to the comptroller of the city of Chicago, Walter H. Wilson, February 9, 1911 (Hall, pages 50-1).

The general principle guiding the apportionment of earnings is the assignment to the city of the usual commission to the office originating the call, together with the apportionment of the balance of the receipts on a mileage basis.

Municipal Requirements.

An important source of extraordinary expense to the telephone company in the past has been municipal requirements. First came the elevation of the steam railroads, with large expenses required of the telephone company in the relocation of its wires. Then came various city ordinances, requiring the removal of poles from the streets in all but the outskirts of the city. The expenses for these purposes have been included in the maintenance account, which has shown such a downward trend in the last 20 years. The relocation and burial of the wires have diminished the expenses for maintenance.

Now the company claims that it may be called on during the next five years to change all of its conduits in the streets where subways have been recommended. These streets are given in the joint report of the Harbor and Subway Commission, and the sub-committee of the city council committee on local transportation, September 10, 1912. Along the 56 miles of subway recommended to be built during the next five years, the company claims it will lose, in the value of abandoned conduits and cables, $1,840,000, and another $250,000 in temporary work during subway construction.

After explaining the necessity for abandoning not only conduit lines in the streets to be occupied by the subways, but also "certain subsidiary intersecting underground conduit and cable leads that now cross the proposed subway, the company estimates that the loss on the underground conduit, upon which there will be no salvage, will be $1,165,000, and the loss upon the cable after deducting its salvage value will be $675,000. Since the proposed subways will practically cut many of the exchange districts in halves, the maintenance of sufficient crossings to give service to all subscribers is estimated to cost $250,000. These estimates are based on the present telephone plant."

The company asserts that on account of the installation of several large sized telephone cables each year, the cost above mentioned on account of subways will be increased $100,000 a year for every year of postponement of subway construction.

While personally a believer in subways for Chicago, it does not appear to the writer likely that the subway program will be sufficiently advanced to require, within five years, an expenditure by the telephone company of more than one-fourth of this $2,090,000, or say $500,000. Surely no more than this will be required during the first three of the coming five years. Any excess above this, if there be such, during the last year or two of the period, might be considered so extraordinary as to justify its temporary capitalization.

In this connection it may be noted that when the subway plans had not been developed on so large a scale as shown by their latest report, the chief engineer of the Chicago Telephone Co. wrote, on March 27, 1912, that a comprehensive system of subways would involve a loss of $2,300,000 to the telephone company.

Extraordinary Depreciation.

Aside from the startling claim of the company that its subscribers should pay to it, during the next five years, $2,090,000 for expenses on account of the proposed subways and $100,000 a year for every year's postponement of such construction, another $4,216,000 is claimed on account of extraordinary depreciation. The magnitude of these claims was first brought to the writer's attention in letters from the company October 1 and 5. Previous letters and conversations had referred only to an expense of about $200,000 on account of subways and to the substitution of some new switchboards and the abandonment of two or three central exchanges. The present claim of the company, as put in final shape in the enclosed letter of October 10th, has necessitated a few days' further examination. The letter from the company's chief engineer is given in full:

Prof. E. W. Bemis, Oct. 10, 1912.
City Hall, Chicago.

Dear Sir: We have reviewed carefully our figures submitted in letters to you of October 1 and 5 on extraordinary depreciation and would like to make some modifications which I believe will more clearly represent the true costs involved. The losses involved in the abandonment of buildings and switchboards because of inadequacy or improper location are as follows:

Table A.

	Original Cost	Net Salvage	Loss
Main building	$ 398,000	.....	$ 398,000
Main & Frainklin C. O. equipment	396,000	$100,000	296,000
Central-Randolph building	159,000	100,000	59,000
Central C. O. equipment	388,000	98,000	290,000
Randolph C. O. equipment	304,000	152,000	152,000
Harrison C. O. equipment	400,000	100,000	300,000
Calumet building	42,000	.....	42,000
Calumet C. O. equipment	123,000	31,000	92,000
Irving Park building	21,000	10,000	11,000
Irving Pk. C. O. equipment	65,000	33,000	32,000
West Pullman building	13,000	6,000	7,000
West Pullman C. O. equipment	41,000	10,000	31,000
Rogers Park	50,000	25,000	25,000
Morgan Park, Washington Heights and Longwood	8,000	2,000	6,000
Total	$2,408,000	$667,000	$1,741,000
Net loss on conduit abandoned in above			85,000
Net loss on U. G. cable			90,000
Total			$1,916,000

The introduction of the semi-automatic switchboard which you and I saw in New York last spring will also result in the abandonment of the "B" boards and the reconstruction of the "A" boards in all other offices as estimated in the following statement:

Table B.

Original cost of Chicago central office switchboards not included in above statement	$3,000,000
Salvage	700,000
Loss on account of semi-automatic switchboard	$2,300,000

The following table will show in detail how we estimated the salvage of $700,000 in Table B:

Table C.

Total answering jacks, all Chicago exchanges	140,000
Total answering jacks in offices of Table A	40,000
Total answering jacks in offices of Table B	100,000
Total "A" sections, all Chicago offices	407
Total "A" sections in Table A	154
Total "A" sections in offices of Table B	253
Salvage on 100,000 answering jacks at $7	$700,000
Salvage on 253 switchboard frames at $250	63,000
Gross Salvage	$763,000
Cost of remodeling 253 "A" sections at $200	$ 50,000
Net salvage	$713,000

(Say $700,000.)

In addition to the above noted losses on buildings and central office equipment which the company must face, large sums will be involved in the loss of conduit and underground cables should the city go ahead with the subway system now planned. These losses will aggregate $1,165,000 for conduit and $675,000 for underground cable, a total of $1,840,000.

In addition to the above amount, which covers the direct loss of plant destroyed, it would be necessary to do a large amount of temporary work during the construction of the subways in maintaining crossings, etc., over the obstructed streets. In a number of instances the proposed subways will practically cut our exchange districts into halves, and it will be necessary of course at all times to maintain sufficient crossings to enable us to give service to all subscribers. We estimate that this item will amount to $250,000.

These two items, of direct loss on plant destroyed and the expense incident to maintaining service during actual subway construction work, together amount to $2,090,000, and this figure would represent the estimated total loss to the telephone company on account of the construction of passenger subways in these streets.

I have summarized the extraordinary reconstruction in the above tables in the following table:

Table D.

Buildings and switchboards abandoned on account of inadequacy of being not well located	$1,916,000
Additional central office switchboards to be abandoned on account of semi-automatic	2,300,000
Underground conduit to be abandoned on account of subway construction	1,165,000
Net loss on underground cables on account of subway construction	675,000
Cost of maintaining service in cables during construction	250,000
Total	$6,306,000

All of the above estimates have been made on the basis of the present telephone plant. As this plant is growing rapidly, delays in the subway work or in the adoption of the semi-mechanical switchboard or for any other reason, will result in substantial increases in investment for switchboards in the offices involved, and for cables in the streets involved in subway construction, and corresponding increases in the losses which must be met. I would expect these to increase at not less than $150,000 per year.

Yours truly,
J. G. WRAY,
Chief Engineer.

It will be observed that this estimates an extraordinary expense during the next five years of $6,306,000. Deducting the $2,090,000 on account of subways, there remains $4,216,000 because of the proposed abandonment of certain buildings and central office equipment.

This matter appeared so serious that the writer felt justified in delaying the report until he could visit all the properties which it was proposed to scrap. We will here consider them in the order in which the chief engineer of the company believes they should be changed or scrapped.

The scrapping of certain buildings with their equipment, in order to put up better buildings or change the location of the exchanges, will be first considered. We will then take up the displacement of other central office equipment to make room for the semi-mechanical or semi-automatic switchboards.

Displacement of Office Buildings and Equipments.

[Note: Here Mr. Bemis takes up in detail and comments upon nine exchanges, which it is proposed to remove or abandon.]

If all the nine exchanges were to be removed or scrapped, the company estimates a net loss in abandoned conduit and cable of $175,000. This added to the $1,741,000 loss on buildings and equipments means a total loss, according to the company, of $1,916,000 from the proposed changes in the above central stations. The company, however, has made a mistake of much importance in its computations. The company has reached its estimate of losses by a deduction of the estimated salvage from what it calls the original cost in each case. The figures given, however, are not the original cost, but are the higher appraised value new of Byllesby and Arnold.

But a larger mistake than that was made. Byllesby and Arnold depreciate by $901,964 the buildings and office equipments which it is proposed to scrap. Since this depreciation was made up by the depreciation reserve already discussed, only the depreciated value less the salvage can now be considered. Making this correction on buildings and equipments and in the same manner about 20 per cent. on the conduits and cables, there is left only about $800,000 of net loss instead of $1,916,000, in case all these exchanges are abandoned within the next five years, as suggested. If only the first six of the exchanges named are thus abandoned, which appear to be the only ones definitely determined upon, the loss after deducting the accumulated depreciation reserve on the particular property in question would not exceed $350,000, while if Rogers Park and Calumet are undisturbed the loss will not exceed $250,000.

The company does not claim that in most cases it is under the necessity of removing these exchanges, except to secure greater economies in future construction and operation. It may safely be assumed that any expense incurred beyond the $350,000 will come back to the company and the subscriber in economies of one kind or another.

In taking this position, no reflection is intended upon the sincerity or wisdom of the company in looking forward to all these changes as desirable. Probably most of them will come in time. The only question is as to how soon.

Semi-Mechanical Switchboards.

The A. T. & T. has been making successful use in its laboratory building in New York of a new switchboard sometimes called the semi-mechanical, sometimes the semi-automatic, which will render possible, it is claimed, not only cheaper operation, but better service. A central station is soon to be equipped in the East with a new board. If it continues to work successfully, the chief engineer of the Chicago Telephone Co. expects that some boards can be secured in a year and a half or two years for installation in Chicago.

This is the basis for the estimate of the company that it will displace $3,000,000 worth of central office switchboards, at a net loss of $2,300,000, during the next five years, or practically in the last three years of the five-year period, and thus make room for the new board. The writer does not see his way to adding anything to the operating expenses of the company on this account. The practicability of the new switchboards is as yet to be determined. So far as the new board may be introduced it is likely to reduce the operating expenses enough to cover, in a reasonable time, the depreciation charged.

About 25 per cent. of the operators are at the so-called "B" boards, which would be no longer needed with the new switchboards. Operators' wages average $6.76 per year per station. One-fourth of this, or $1.69 would be saved, if the company's claims for the new switchboard

prove true. The saving on the 400,000 telephones which will be in use in the city by the company by 1915, would be $676,000 a year. It would, therefore, seem proper for the savings from the new board to pay for its introduction, which at this rate, it would speedily accomplish, rather than to treat the possibility of introducing this board as a factor in the fixing of rates today. The new switchboard may cost more than the old, but any increased interest thereon would leave intact much of the above saving of over $600,000 a year.

Furthermore, the appraisers have written off from the present switchboards under discussion over $800,000 which is already provided for in the depreciation reserve. This will reduce the amount that would have to be raised from other funds to about $790,000.

Conclusions on Extraordinary Depreciation.

If subways should entail a $500,000 cost upon the company, and if a further loss of $250,000 in comparison with the present appraised value is incurred in the abandonment or removal of many of its central exchanges, or a total of perhaps $750,000, this might mean a further burden upon the subscriber of $150,000 a year for the next five years. It is quite possible, however, that the subway cost, when it comes, could be wisely capitalized. With the growth, moreover, in revenues and the larger growth that might come from a reduction in charges, the above mentioned burden would not necessarily be followed by such a reduction in the earnings of the company as might at first thought be expected. It is, indeed, possible that these anticipated burdens will not materialize to any more serious degree than those which the company has met in the past without any considerable increase in expenses or reduction in its depreciation reserve.

Results of the Ordinance of 1907.

In 1906 and 1907 large reductions were made in telephone rates. No attempt has been made to go back of 1900, but since January 1 of that year the chief changes have been as follows:

Flat rate business telephones were charged $175 a year in parts of the city outside of the business center, until 1906, when a court decision led to the reduction of this rate to $125. At the same time, in 1906, the charge of $175 for a copper metallic circuit, or two-wire system, was reduced to $125, and the grounded one-wire circuit disappeared.

The above changes meant a reduction of $50 to all flat rate users having return metallic circuit and a reduction of $50 to every flat rate business user outside of the center of the city.

On December 1, 1907, the flat rate single line residence telephones were reduced from $100 to $72, while the two-party line was reduced from $75 to $56 and the four-party line at $60 was abolished. The four-party line users could secure a two-party line at $4 less than the four-party line had cost.

Message rates were reduced from 1,000 messages for $95 in 1906 to $80 in 1907 for the same number of messages, and $60 thereafter. The charge for 3,000 messages similarly fell from $162 in 1906 to $150 in 1907, and $114 in 1908, while for 5,000 messages it fell from $222 in 1906 to $210 in 1907, and $160 in 1908.

Extension telephones which had been $12 to $30 in 1905, were reduced to $6 in December, 1907.

On nickel telephones great reductions were made in 1907. Instead of guaranteeing 10 cents a day and securing two messages on a ten-party line, a business man now, for 12½ cents, can have two messages a day on a two-party line and extra messages at 5 cents each. On a two-party nickel line, a business man formerly guaranteed 20 cents securing thus four messages. He is now charged the same amount on a single party nickel line.

In case of residences, a person now guaranteeing a nickel a day has the use of a four-party line, while before December, 1907, he had only the use of a ten-party line for the same charge.

A subscriber to a neighborhood exchange formerly paid 10 cents toll for telephoning to anybody outside of his exchange, while a person outside telephoning him must also pay 10 cents; but since December 1, 1907, the charge to the neighborhood exchange subscriber was reduced to 5 cents and no charge was made to any other subscriber within the city limits for telephoning messages to the neighborhood exchange subscriber.

The total reduction in earnings per telephone was from $49.74 in 1906 to $39.72 in 1908. This total fall of $10.02, if multiplied into the number of telephones in use at the close of 1908 of 231,180, would mean a reduction of over $2,300,000 that took place in the city and suburbs, mostly in the city, during those two years. This decline in revenue per telephone, together with the cost of transforming the ten-party to four-party lines, made a considerable reduction in the ratio of net earnings to invesment.

The net return, before making any allowance for additions to the depreciation reserve, fell from 13.82 per cent. in 1906 to 7.10 per cent. in 1908. The dividends, however, were not affected, but during 1908 and 1909 nothing was added to the depreciation reserve. The growth of business and earnings was so great in 1910 and 1911 that over $1,000,000 a year in the city and suburbs was put into the depreciation reserve in addition to the regular 8 per cent. dividend.

The earnings before deductions for depreciation reserve bore the following relation (Table No. 20) to the average investment as shown by the books during the year in question. The number of telephones at the end of each year is also given for city and suburbs:

Year	Ratio of Earnings to Investment (Per Cent.)	Number of Telephones
1905	14.60	143,223
1906	13.82	170,834
1907	8.12	202,681
1908	7.10	231,180
1909	8.25	262,359
1910	9.89	300,618
1911	9.89	335,652

Table No. 20. Earnings and Telephones Since 1904.

Improvement in the Service.

The public have a right to be, and are, as much interested in good service as in low rates. Poor service, with resulting dissatisfaction, even though accompanied with a saving in operating expenses, is no benefit in the long run to a company.

Widely diverse opinions prevail in the city as to the success of the company in trying to give good service. No system of regulation, however, which stops short, as all regulation everywhere has done, of allowing the public regulating body to appoint both the manager and a majority of the board of directors, would promise any complete solution. Such a solution might easily involve other difficulties as great as those removed by it, and anyway need not be considered as needed or practicable in Chicago.

Something, however, could and should be done. Some means should be devised for better protection to the public against possible carelessness and give it greater confidence that its just complaints are being properly met.

City Telephone Bureau.

It would be to the advantage alike of the company and of the public, if the city maintained a properly equipped bureau for receiving and investigating all complaints of service. Telephone users often believe that they cannot secure proper consideration of their grievances, and so do not attempt to present them, but disseminate somewhat widely among their friends their opinion of the company.

If such a bureau were open for all complaints and took them up promptly with the company, the latter would soon be spurred on by public opinion to approve any conditions that could easily be improved. If tnis could be done, the bureau's reports to the council would doubtless be followed by efficient action. Provided, as the evidence seems to show, that the company really desires to give good service, such a bureau would be a great help also to the telephone company. The latter would, in some cases, learn, and thus more speedily improve, the weak points in the system, and in other cases, it would doubtless convince the bureau, and through the latter the public, that some of the complaints were not well founded.

There is ample precedent for such a course by the city in the offices which are now being maintained for the inspection of gas and electricity and traction service. If desired, the scope of the bureau could include the systematic gathering of information so that councilmanic action may be easier when it next becomes necessary, five years hence, to fix the rates. Such investigations are constantly being made for the Massachusetts Highway Commission, which controls the New England Telephone & Telegraph Co.

The present telephone ordinance lodges some of the work here proposed with the city comptroller, but it does not go far enough. It gives him the right to examine the accounts and records of the company, but does not appear to create any complaint department or intermediary between the public and company, such as is now proposed. Whether the power of the comptroller should be increased to cover the whole subject, or whether the work should be given to the city electrician, to the secretary of the gas, oil and electric light committee, or some one else, is a question both of law and policy upon which no opinion is now expressed.

Measured Service for Residents.

While the present report does not take up specified changes in rates, but only the question of whether the rates as a whole can be changed and how much, it is nevertheless important, and in accordance with the desire of the committee, that a reference be made to three other subjects, nickel telephones, subscribers' meters and the character of the service.

The nickel coin box is popular and needed in drug stores and many other public places. In many residences it is also desired. This is especially true where there is danger of abuse by neighbors imposing on the good nature of the telephone subscriber, or where it is desired to pay 5 cents per call rather than to pay for a month's use at one time.

On the other hand, some are much opposed to the nickel telephones, and a considerable portion of the subscribers to the two-party and four-party nickel telephones in residences apparently would be better pleased to pay for their calls by the month without any use of nickels or slugs. Such a service is offered in some other large cities in the form of a measured residence service for either one-party, two-party or four-party lines. It is believed that a rate can be adopted sufficiently attractive to enable those who are dissatisfied with the nickel telephones to take the new service. A certain payment per month would be guaranteed, and all calls in excess of what that amount calls for at, say, 5 cents, would be paid for at the end of the month as in the case of the nickel telephones; or, a readiness to serve charge per month could be made, and a lower calling rate than 5 cents could be adopted.

Meters.

The company has already equipped a large portion of its present measured service lines, which are chiefly on business places, with meters at the central offices, known as central office message registers, and expects to finish the entire installation within four months. A meter for the use of subscribers, whether business or residence, who have a single-party measured line, has been developed by the A. T. & T. and sufficiently tested on about 200 business premises in Chicago to show that it is practicable.

When the Maryland Public Service Commission issued an order, some months ago, for abolishing all flat rate business lines, an order whose execution has been postponed pending further investigation, it was provided that any parties who desired one of these meters could have it on payment of 25 cents a month, or $3 a year. The commission investigated the meters on the market and considered the one offered by the A. T. & T. to be the best and most reliable. The cost of $3 a year was considered by the commission to be only a fair payment for the investment and for the care and depreciation of the same. Not 1 per cent. of those who were expecting to come immediately under the metered service ever applied for a meter.

Very few using the meters in this city think there is sufficient evidence of mistakes in the bills of the company to warrant their bothering to have the device, even if free. Very few, indeed, express any belief that it is useful enough to warrant their paying even the small rental for it.

Under these circumstances it would seem a mistake to burden the rates of all the subscribers with a device which few appear to want. Yet it would be well to provide that any one might have this meter, if he desires to pay $3 per year for it.

There appears to be no meter on the market today for two-party and four-party measured lines. Where such service is given, as in Boston and Baltimore, a record is kept on paper slips by the operators, as has been the case until recently, and still is to some extent with measured business lines here.

A recording device that will show to the subscriber the number of coins or slugs that have gone into the coin box, would be popular with the subscriber and would also be a check for the telephone company upon its collectors. But there seems to be no such device at present in use by any telephone company, whether Bell or Independent. If the suggestion for measured service is adopted for residences, there would be less need for such registers, since many of those who are dissatisfied with this and other features of the coin box would doubtless change to measured service.

Conclusions.

In the light of all the above, a reduction of $700,000 in the charges of the Chicago Telephone Co. within the city limits appears reasonable. Such a reduction can be met by the company in several ways.

1. Instead of putting about $975,000 into the depreciable reserve, as in the city exchange in 1911, $500,000 may be set aside for that purpose until repairs and the cost of station removals, now amounting to about 7.5 per cent. of the plant investment, shall decline further, as they are likely to do. Even the $500,000 left in the reserve on this supposition, together with the actual repairs and removals of 1911, would bring the total maintenance and depreciation expense only to 9 per cent. This item, like the Chicago expense for station removals, is higher than the average for the Bell companies, either as a whole or in the larger cities.

If $475,000 of the proposed reduction of $700,000 be taken from the depreciation reserve, the remaining $225,000 may

be secured by a reduction of the dividend on the company as a whole from 8 per cent. to 7.1 per cent., or on the city portion thereof to 6¾ per cent. Since the American Telephone & Telegraph Co., which owns nearly all of the stock, collects in rentals within the city about $200,000 more than the service appears to cost, or about 1 per cent. on the stock, a reduction in the dividend rate to 6½ per cent. or 7 per cent. seems not unreasonable.

2. For maintenance and depreciation 9½ per cent. might be allowed. On this basis the reduction in last year's additions to the reserve would be about $350,000. The remaining reduction of $350,000 could be secured by a reduction of the dividend on the city part of the stock to 6¼ per cent. Since the A. T. & T. would, on this hypothesis, continue to receive the excess rental, that would virtually mean a three-fourths per cent. further dividend.

3. Another solution, in lieu of part of the reduction of dividends, suggested above, would be the reduction of the rental. This is about 1¾ per cent. on all the property and about 2¼ per cent. on the stock, or about $1.75 per telephone. Of the $445,550.72 paid in 1911 and of the $475,000 or more that will be paid in 1912, $200,000 could apparently be deducted by the local company and still leave the A. T. & T. a reasonable return.

4. Still another treatment of the matter would be a smaller reduction in the dividend and the utilization of the 1 per cent. profit obtaining by loaning to the Central Union at 6 per cent. the proceeds of over $10,000,000 of the $14,000,000 of 5 per cent. bonds lately sold by the Chicago Telephone Co. As this money is gradually withdrawn from the Central Union to meet the construction needs of the Chicago company, the maintenance of a 7 per cent. or 8 per cent. dividend rate will represent a smaller percentage of the total investment than now. Taking the city and suburban divisions together, the case stands thus:

	Amount.		Return.		Per cent. of return on tot. Securities.	
	1911.	1916.	1911.	1916.	1911.	1916.
			Dividends at 8%.			
Stock	$27,000,000	$27,000,000	$2,160,000	$2,160,000		
			Interest at 5%			
Bonds, notes..	6,000,000	20,000,000	300,000	1,000,000		
Total	$33,000,000	$47,000,000	$2,460,000	$3,160,000	7.45	6.72

Table No. 21. Declining Rates of Return.

Without any reduction in the rate of return on the stock and bonds the larger proportion of bonds now assured will reduce the average rate of return on all these securities from 7.45 per cent. to 6.72 per cent. It may be remarked that all of the new 5 per cent. bond issue of $14,000,000 has netted the company about par or a trifle above.

4. Outside of the expense that may be entailed by subway construction in 1915-17, or the last three years of the coming five-year period, there seems little in the claim for a special allowance for extraordinary depreciation.

It is assumed that little if any expense will be incurred on account of subway construction in 1913, and that the expense to the Chicago Telephone Co. will not exceed $125,000 a year thereafter, or that the excess should be capitalized. When the rates are again adjusted, five years hence, this matter can be more intelligently treated.

It is believed that a reduction of $700,000 in telephone rates will stimulate the growth of the company, and leave enough in the maintenance and in the depreciation reserve to meet the needs of the next five years, and with such extraordinary needs as are likely to develop from the change of central stations, displacement of switchboards or subway construction. It will also leave a fair return to the owners of the property. If, however, the new ordinance should provide, as it well may, for a measured service to take the place of the nickel service for those who desire to make the change, the cost to the company of this change, divided over the five-year period, should be deducted from the above $700,000 a year.

Moreover, the ability of the company to stand this reduction in revenue will be affected by how it is done. The importance of a wise readjustment of the rates among over twenty classes of service can hardly be exaggerated.

If the company were not confronted with the expenses and loss of business that to some small extent may attend the competition of the rival company, the Illinois Telephone & Telegraph Co., with its automatic telephones, a lower rate of return on capital might be demanded. If this competition, however, should become at all serious, the Chicago Telephone Co. might be expected to reduce rates voluntarily as much as is here advised.

While operating expenses per telephone are increasing, the investment per telephone is decreasing and the business is rapidly growing. The number of telephones in the city, aside from the 25,000 or more of the rival company, grew from 268,383 on December 31, 1911, to 298,380 on October 28, 1912, an increase in the ten months of about 30,000, as compared with an increase of only 29,300 in the previous twelve months.

This situation, joined to the ability of the company to finance its extensions for three or four years out of the $14,000,000 of 5 per cent. bonds just floated may permit the company to make the suggested reduction in rates without any cut whatever in its 8 per cent. dividend or in its rental to the A. T. & T.

In no investigation hitherto conducted by the writer has a company pursued as open a policy with respect to its books and methods as has the Chicago Telephone Co., and in turn the writer has endeavored to give due weight to al considerations affecting both the welfare of the company and the just demands of the public.

Pioneers Move to Larger Offices.

The office of the secretary of the Telephone Pioneers of America has been removed to larger quarters, at 30 Church street, New York city, at which place the secretary will be glad to receive any Pioneers visiting the city.

The group pictures of the members in attendance at the second annual meeting, at the Hotel Astor, in New York, are now ready and can be had direct from the secretary of the association or from the photographer. The price of the photographs is $1.53.

Mutual Association Formed.

An enthusiastic meeting was held in Lanark. Ill., recently, at which representatives of various mutual companies were present. It was decided to form a permanent organization to be known as the Carroll County Mutual Telephone Association. This was done and J. R. Wolf was elected president; C. C. Thill of Savanna, vice-president; and Boyd Zuck, secretary.

Delaware, Ohio, Company Buys Bell Property.

The Citizens Telephone Co., of Delaware, Ohio, has been authorized by the Public Service Commission, of that state, to purchase from the Central Union Telephone Co. its property in Delaware and in the village of Radnor.

Louisiana Tax Report Shows Telephone Gains.

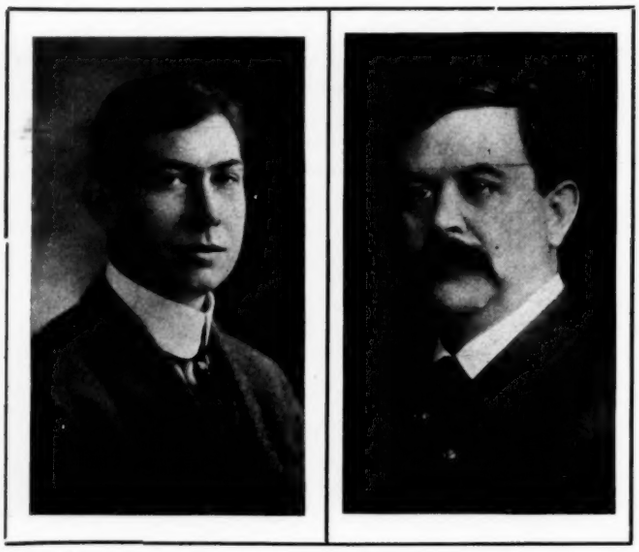
The report for 1912 of the Louisiana State Board of Appraisers shows telephone property in the state assessed this year at $3,779,637, an increase over 1911 of $259,960. Telegraph property in Louisiana is assessed this year at a total of $1,093,259, a gain of $15,335.

From Factory and Salesroom

Conventions: Kansas Independent Telephone Association, Hutchinson, December 17, 18, 19: Northwestern Cedarmen's Association, Duluth, Minn., January 7, 8

Automanual Changes Headquarters.

The North Electric Co. has moved from its former Cleveland factory to Galion, Ohio, where one of the most modern of manufacturing buildings has been erected for its use by the Telephone Improvement Co. The North Electric Co. will there produce the Automanual and Tele-



Garrison Babcock. Charles H. North.

chronometer systems, which will be distributed and engineered by the Telephone Improvement Co.

Offices have been opened at 1343-52 Monadnock Block, Chicago, by the Telephone Improvement Co. Garrison Babcock, vice-president of the North Electric Co., has been appointed general manager of the Telephone Improvement Co. and will be located in Chicago.

Mr. Babcock's experience in maintenance, construction and management of operating companies and engineering and management of telephone manufacturing fits him well for this new responsibility.

Jay G. Mitchell, formerly equipment engineer of the North Electric Co., will hold the office of sales engineer in this new organization.

In the organization of the engineering department under the direction of H. G. Webster, chief engineer, will be the North Electric Co.'s former staff: Jos. L. Wright, J. D. Bonnar, W. N. Tune, Arthur Kneisel, A. C. Stuart, W. P. Albert; A. L. Christian, chief installer and E. S. Downs, chief draftsman.

The company's plan for the distribution of the Automanual, although a new one in the telephone industry, has proven its success in the financing of the trunk railroads of this country, covering their rolling stock, namely, car trust certificates, which, when applied to the telephone plant are termed equipment trust certificates. These cover 75 per cent. of the purchase price of Automanual equipment and mature currently, as the economy earnings results. This plan is one which will enable operating companies to avail themselves of the immediate improvements embodied in Automanual without disturbing their financial formation. The short term security, resulting in the equipment trust certificates, being the most sought after by investors, should prove a great stimulant to the telephone industry.

The company, through an information bureau, will keep in close touch with the developments of legislative regulation, authorized mergers of competing telephone properties and municipal ownership. This bureau will not only be open to all Independent telephone companies, but they are solicited to co-operate in making the bureau as great an advancement of the industry from the Independent standpoint as may be possible.

This department will have the best support TELEPHONY can give it and this paper joins with those who appreciate this new activity in the telephone field in wishing the new movement success.

A Timely Suggestion.

"In TELEPHONY, week before last, we noticed an article written by B. Yore, in regard to the opening of lines," write Stewart Bros., Ottawa, Ill.

"We wish to say that we think Mr. Yore's idea very good but we would like to present what we think is a better one. Get one of Stewart Bros.' new testing sets and by the use of same, one can always tell which way the trouble lies from any point on the line without cutting a wire.

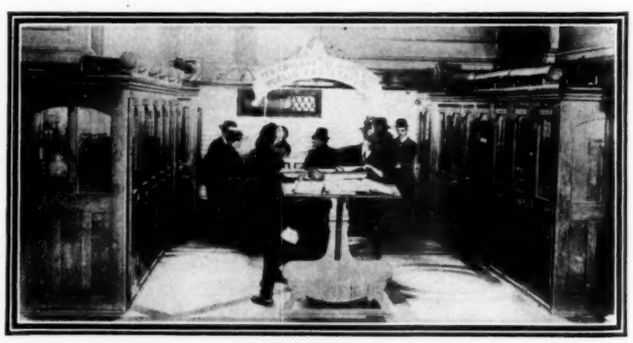
"It is easy to see that the saving of the time lost in cutting the wires and soldering the joints would soon pay for a test set of this kind, and there would be no slack or joints introduced into the line.

"This test set not only tells which way the trouble is from the tester, but approximately how far, and it is also a portable telephone."

Ventilation of Telephone Booths.

There are telephone booths at the South Station, Boston, Mass., that are ventilated by Sturtevant Ready-to-Run electric blowers. As these booths are used constantly, this mechanical ventilation is of great benefit, as it provides fresh air, whether the door of the booth is open or closed, and cools the booth as well. The superior quality of the air in these booths is very noticeable to the person occupying them.

The booths are arranged in two groups of seven each,



Sturtevant Installation at Boston.

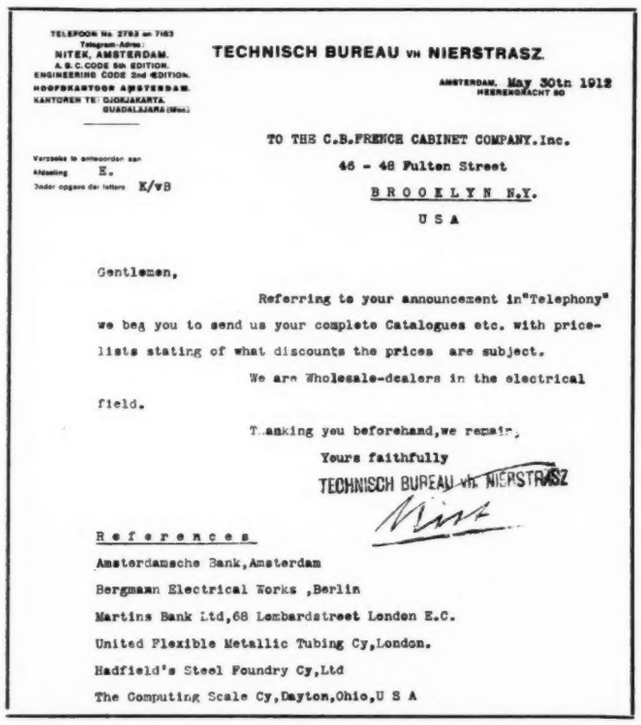
each group being ventilated by one Sturtevant "D" size Ready-to-Run ventilating set. This is placed upon the top of the end booth and blows directly into a fibre pipe which runs over the top of the booths, as may be seen in the illustration. From this pipe there are discharge pipes, delivering the air to the booths through deflectors especially designed to prevent blowing directly upon the head.

An exit for the air from the booths is provided in the doors. A brass ventilator is placed in the bottom of the inside door and in the top of the outside door, so that the air leaving the booths at the bottom enters the dead air space between the doors and is finally discharged at the top. In this way, there is no opportunity for the transmission of sound. The fan and motor operate so noiselessly that the occupant is not disturbed.

The fan operates at 850 R. P. M. and delivers 450 cu. ft. of air per minute, or 64 cu. ft. to each booth, changing the air in the booth about every minute. The system is patented and was built and installed by the B. F. Sturtevant Co., of Hyde Park, Mass.

Advertisement Brings Many Foreign Inquiries.

The C. B. French Cabinet Co., of Brooklyn, N. Y., recently established a satisfactory connection in Amsterdam, Holland, through the medium of an advertisement placed in TELEPHONY. The Amsterdam firm is the Technisch Bureau vh Nierstrasz, and its inquiry is here reproduced.



TELEFOON No. 2783 en 7163
Telegram-Adres:
NITEK, AMSTERDAM.
A.B.C. CODE 5th EDITION.
ENGINEERING CODE 2nd EDITION.
HOOFDKANTOOR AMSTERDAM.
KANTOREN TE: DJOKJAKARTA.
GUADALAJARA (Mex.)

TECHNISCH BUREAU vh NIERSTRASZ.

AMSTERDAM, May 30th 1912
HEEREGRACHT 80

Verzoeke te antwoorden aan Afdeeling E.
Onder opgave der letters K/vB

TO THE C.B.FRENCH CABINET COMPANY.Inc.
46 - 48 Fulton Street
BROOKLYN N.Y.
U S A

Gentlemen,

Referring to your announcement in"Telephony" we beg you to send us your complete Catalogues etc. with price-lists stating of what discounts the prices are subject.

We are Wholesale-dealers in the electrical field.

Thanking you beforehand,we remain,

Yours faithfully
TECHNISCH BUREAU vh NIERSTRASZ

References
Amsterdamsche Bank,Amsterdam
Bergmann Electrical Works ,Berlin
Martins Bank Ltd,68 Lombardstreet London E.C.
United Flexible Metallic Tubing Cy,London.
Hadfield's Steel Foundry Cy,Ltd
The Computing Scale Cy,Dayton,Ohio,U S A

An Inquiry from Afar.

An order was closed as a result of this and good future business is anticipated by the C. B. French Cabinet Co. as a result.

The company also reports that it has received responses from South Africa, Liverpool, Eng., and a number of other foreign points, and is much gratified with the results of its advertising in this medium.

The Automatic Monitor System.

"In asking the users of our Automatic Monitor System how they liked it, we found everybody well pleased," says Ellsworth Keith, manager of the supplies sales department of the Automatic Electric Co., Chicago.

"They state their service has been materially improved and actual results obtained in increasing the number of subscribers," he continues. "One manager stated that, when he used his system the first time, he found several operators were giving short and impolite replies to subscribers. He took occasion to reprimand them and has experienced no trouble since. Another states that he was able to exonerate an operator who had been complained of several times by a certain subscriber. It was found that the subscriber was not speaking clearly and would not assist the operator by repeating the number wanted when asked to do so. The manager watched this line and was able to satisfy the subscriber by a few polite instructions and suggestions.

"We have had one case of trouble (?) and it is such a good story that we believe Mr. Spangler, of the Bryan Telephone Co., Bryan, Ohio, will laugh with us when we tell it.

"After their system had been shipped we received a letter stating that it would not work and that they couldn't make it work. We sent detailed instructions, with blue prints, etc., but it still would not operate. We sent an inspector. His report was as follows:

"'Visited Bryan, Ohio. Trouble caused by their installing the Monitor switch upside down. Believe no further report necessary. It is working now.'"

Electrose Mfg. Co. Wins Decision.

A recent copy of the Official Gazette, issued by the United States Patent Office, at Washington, D. C., contains a decision of the commissioner of patents in the case of Steinberger vs. Hewlett, in favor of the former. Mr. Steinberger is president and general manager of the Electrose Mfg. Co., of Brooklyn, N. Y. The decision is, in brief, as follows:

"This is an appeal by Steinberger from a decision of the examiners-in-chief affirming the decision of the examiner of inferences awarding priority of invention to Hewlett as to the following issue:

1. A disk strain insulator, comprising suspension members, a mass of insulating material partially enveloping the same, said mass being provided centrally with a disk integral therewith and lying substantially in the general equatorial plane of said mass, and further provided with flanges extending in opposite directions from said equatorial plane.
2. A disk strain insulator, comprising suspension members, a mass of insulating material partially enveloping the same and having a disk portion, said disk portion being provided with annular collars extending in opposite directions and in the general direction of said suspension members.
3. A disk strain insulator, comprising strain members, a body of insulating material partially enveloping the same and having a comparatively large disk, said disk being provided with collars integral therewith and extending in opposite directions.

The invention relates to disk strain-insulators for electric conductors designed to mechanically secure and at the same time electrically insulate two connecting parts. It was desired to construct these insulators so as to prevent creepage of current over the surface thereof, not only in dry weather, but in wet weather as well, and this was accomplished by the construction claimed."

Mr. Steinberger claimed that, although filing his application after that of Mr. Hewlett, he had, in reality, perfected the invention in 1905; that he had disclosed the facts to one, Buck, and that, through Buck, Hewlett must have been made aware of the details. Hewlett did not testify at the hearings and the decision is summarized, as follows:

"Where in a case involving the question of originality an inventor fails to take the stand who is available as a witness when the facts in his favor, if any there be, are peculiarly within his knowledge, the legal presumption follows that his testimony would be unfavorable to his case.

Evidence reviewed and held in the absence of any testimony on behalf of H. to establish that he was not an original inventor, but derived his knowledge of the invention in issue from S. through a third party and priority awarded to S."

Legal Cases and Decisions

By A. H. McMillan

Line on Railroad Right of Way.

In a suit by the Western & Atlantic Railroad Co. against the Western Union Telegraph Co. to restrain proceedings to condemn a right-of-way for a telegraph line along a railroad, a number of novel questions were decided. It was held that the telegraph company might condemn property on a railroad company's right-of-way when the proposed line of telegraph would be so constructed as to produce no material interference with the railroad company's free exercise of its franchise or with the actual operation of the railroad.

It appeared that the telegraph service was afforded to the railroad company by an existing line of telegraph by virtue of a contract between the railroad company and the telegraph company, which contract was about to terminate; that the existing lines were located on an advantageous portion of the right-of-way; and that the railroad company, in order to obtain the necessary telegraph service intended to build a line of its own on the location of the old telegraph line. Under such circumstances it was held that the railroad company had a preferential selection of the route and that the telegraph company would be enjoined from condemning the route which had been selected by the railroad company. It was also held that the telegraph company could not construct a telegraph line over lands of the state without the state's permission, except upon due compensation.

The railroad company urged the possibility of the telegraph company stringing telephone wires along the right-of-way for the use of a telephone company. But as the telegraph company in its notice of condemnation sought only to occupy the right-of-way for constructing and maintaining a telegraph line, the objection was held to be no obstacle. If the telegraph company attempted to string a telephone wire and thus impose an additional burden, it was held that the railroad company would have its remedy against such an act.

The measure of damages for the railroad company was held to be the value of the land actually taken and extent to which the use of the right-of-way by the railroad company was diminished by the telegraph company; that the right-of-way of the railroad company has no general market value for other uses than that to which it is applied, and that peculiar advantages and benefits accruing to the telegraph company from the use of the right-of-way, could not be considered in the assessment of damages.

This ruling was held to have the effect of making the eminent domain laws of the state unconstitutional. Western & Atlantic Railroad Co. vs. Western Union Telegraph Co., 75 Southeastern, 471.

Priority of Exercise Carries Superiority of Rights.

As between electric companies exercising similar franchises upon the same streets, priority of exercise carries superiority of right. So held the supreme court of Pennsylvania in a suit brought by the Edison Electric Illuminating Co. of Williamsport, Pa., against the Citizens' Electric Co., of the same place. The Edison company, since 1884, under permission granted by ordinance of the city, occupied certain streets and alleys with its appliances for supplying light, heat and power.

The Citizens' Electric Co., by ordinances of 1896 and 1907, were granted permission to occupy the streets, lanes and alleys of the city with its poles and wires, and erected such appliances to also furnish heat, light and power to customers. The Edison company charged the Citizens' company with having so constructed and maintained its poles and wires as to rest upon the poles and wires of the Edison company, and also so as to be in dangerous proximity to them. The evidence showed that at 11 different places there were contacts between the wires of the two companies and at 14 different places there was only a distance of from one to 14 inches between the wires.

The Edison company alleged that the defendant company had not only placed its poles and wires in dangerous proximity to the poles and wires of the Edison company, but had also threatened to run its poles and wires between the wires of the Edison company and to cut and move the wires and interfere with the proper operation of the lines. The complainant prayed for an injunction to restrain the continuation of the unlawful situation complained of. The court in deciding for the complainant company quoted as follows:

"Equity will adjust the conflicting interests as far as possible and control both so that each company may exercise its own franchise as fully as is compatible with the necessary exercise of the other's. But, if interference and limitation of one or the other are unavoidable, the latter must give way. . . . Equity will enjoin, not only wanton or negligent damage, but all interference which is not strictly unavoidable; and, in regard to keeping defendant's wires clear of those in *bona fide* use by the plaintiff and necessary for its business, the injunction must be absolute without regard to extra cost of other methods."

The court also decided that some approximately safe rule should prevail and govern the clearances in the pole line construction of the companies. The court established 24 inches as the clearance that should be maintained. Edison Electric Illuminating Co. vs. Citizens' Electric Co. (Pa.), 84 Atlantic, 438.

Purpose of Use Determines Right.

An electric company had the right to use streets for the purpose of supplying light to a city. It erected certain poles to supply light in the residences of citizens. Some abutting owners of property near the highway objected to the company's use of it for the latter purpose because they had not been compensated in damages.

The court held that the abutting owners were entitled to compensation, and that the right to use the street for public lighting purposes did not give the company the right to use them for the purpose of supplying light to private consumers. Post vs. Suffolk Light, Heat & Power Co., 126 N. Y. S., 401.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

H. W. RINK has resigned his position as manager of the Star Telephone Co. at Upper Alton, Ill.

JOHN J. MITCHELL has been elected a director of the Chicago Telephone Co., to fill the vacancy in the board caused by the death of Arthur D. Wheeler.

J. J. KINNEY, of Smithville, Texas, has been placed in charge of the Southwestern Telegraph & Telephone Co.'s exchange at Hallettsville. He succeeds I. T. Jackson.

E. L. DICKERSON has resigned his position as local manager of the Southwestern Telephone & Telegraph Co. of Yoakum, Texas. C. A. Jones of San Antonio has been appointed to fill the vacancy.

JAMES J. BRAHANY has been made manager of the Madison exchange of the Wisconsin Telephone Co., to succeed R. W. Daggett, Jr., resigned. For the past three years Mr. Brahany has been with the district organization of the company as district commercial agent. He is a brother of Thomas W. Brahany, assistant secretary to President Taft and former secretary of the tariff board.

New Companies.

TRINIDAD, COLO.—An Independent telephone line is soon to connect Trinchera with Trinidad. Articles of incorporation have been filed with James E. Shearer, P. N. Pattison, and W. M. Hudson as incorporators. The capital stock is given as $5,000.